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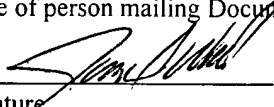
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James D. Wood

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October 25, 2004

Date of Signature

Re: Application of: Cash et al.  
Serial No.: 09/653,196  
Filed: August 31, 2000  
For: Land and Front-End Effectiveness Model  
Group Art Unit: 2123  
Examiner: Thomas H. Stevens  
Our Docket No.: 8320.10 (1001-0815)

TRANSMITTAL OF BRIEF ON APPEAL

Please find for filing in connection with the above patent application the following documents:

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Page 2

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Respectfully Submitted,

MAGINOT, MOORE & BECK

A handwritten signature in black ink, appearing to read "James D. Wood", written over the firm name.

October 25, 2004

James D. Wood  
Registration No. 43,285  
Bank One Center/Tower  
111 Monument Circle, Suite 3000  
Indianapolis, IN 46204-5115

Enclosures

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES



CR Docket No. 8320.10

MMB Docket No. 1001-0815

Application of: **Cash et al.**

Group Art Unit: 2123

**ORIGINAL**

Serial No. 09/653,196

Examiner: **Thomas H. Stevens**

Filed: **August 31, 2000**

For: **Lane and Front-End Effectiveness Model**

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**BRIEF ON APPEAL**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This is an appeal under 37 CFR § 1.191 to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office from the final rejection of the claims 1, 3-18 and 20-31 of the above-identified patent application. These claims were indicated as finally rejected in an Office Action dated June 4, 2004. Three copies of

the brief are filed herewith, together with the \$340.00 fee required under 37 CFR § 1.17(c). Also, please provide any extensions of time that may be necessary and charge any fees that may be due to Account No. 13-0014, but not to include any payment of issue fees.

**(1) REAL PARTY IN INTEREST**

NCR Corporation of Dayton, Ohio is the assignee of this patent application, and the real party in interest.

**(2) RELATED APPEALS AND INTERFERENCES**

There are no appeals or interferences related to this patent application (serial no. 09/653,196).

**(3) STATUS OF CLAIMS**

Claims 1, 3-18 and 20-32 are pending in the application.

Claims 1, 3-18 and 20-32 are finally rejected.

Claims 1, 3-18 and 20-31 are being appealed, and are shown in the Appendix attached to this Appeal Brief.

**(4) STATUS OF AMENDMENTS**

Appellants have filed no amendments subsequent to the final rejection contained in the Office Action mailed June 4, 2004 (hereinafter the "Office Action").

## **(5) SUMMARY OF INVENTION**

In summary, the Applicants' invention is a method and apparatus for a lane and front-end effectiveness model. (Specification at page 1, lines 10-15). In one embodiment, use of the model allows a user to analyze, in detail, changes in check stand design, transaction procedures and lane configurations. (Id. at page 11, lines 17-18).

The model includes pre-itemization events, itemization events, finalization events, bagging events and intervention events. (Id. at page 14, lines 8-25). Pre-itemization events include the unloading of items from a cart to a front-belt of a check stand. (Id. at page 14, lines 10-11). Itemization events include the entry of items into a point-of-sale system (e.g. scanning or keying) and placement of the item onto a back-belt. (Id. at page 14, lines 12-14). Finalization events include tender processing and resolution events. (Id. at page 14, lines 16-19). Bagging events include the bagging of items by one or more of the customer, a cashier, or a bagger. (Id. at page 14, lines 20-22). Intervention events include miscellaneous or resolution events, such as resolution of transaction problems, by a super helper. (Id. at page 14, lines 23-24 and page 18, lines 16-19).

A super helper is one of five types of labor represented in the model. (Id. at page 38, lines 27-28). The other labor types are cashiers, pay station cashiers, baggers and overflow resources. (Id. at page 38, lines 27-28). Super helpers are scheduled in the model as a pool and are available for interventions or, if desired, to act as baggers on a first-come-first-serve basis. (Id. at page 39, lines 4-7).

The model allows a user to determine the mode in which the model will simulate customers arriving at a particular lane. In an unlimited mode, a customer is always available for service when a lane has capacity. (Id. at page 13, lines 25-27). In a limited

arrival mode, there may be a time interval between customer arrivals. (Id. at page 13, line 29 through page 14, line 1). The time interval may be constant or random. (Id. at page 14, lines 1-2).

The model includes a data input dictionary that lists and defines all of the parameters in the model under the control of a user of the model. (Id. at page 12, lines 4-5). The parameters under the control of the user thus define a particular scenario that is to be modeled. The parameters allow the selection of the front-end configuration including the number and types of lanes and the length of the scenario. (Id. at page 23, lines 3-6). For some parameters, a scalar value is used. For example, transaction itemization parameters are scalar. (Id. at page 24, lines 11-12). For transaction time events, the scalar values include a first parameter specifying the mean value and a second parameter specifying the standard deviation of the time of the event. (Id. at page 24, lines 16-18). To assist the user in selecting the parameters to define a particular scenario, a predetermined allowable range of values for a particular parameter may be displayed to the user. (Id. at page 26, lines 28-29).

## **(6) ISSUES**

Whether claims 1, 3-18, and 20-31 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Madigan-E et al. (hereinafter “Madigan”), in view of Human Factors Engineering (“Lane and Front-End Effectiveness Model” (1999)).

## **(7) GROUPING OF CLAIMS**

The claims do not stand or fall together.

Claim 1 forms a first separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claims 3, 7, 9-15 and 17-26 form a second separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claim 4 forms a third separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claim 5 forms a fourth separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claim 6 forms a fifth separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claim 8 forms a sixth separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claim 16 forms a seventh separately patentable group which is argued independently of the other claims for purposes of this appeal.

Claims 27-31 form an eighth separately patentable group which is argued independently of the other claims for purposes of this appeal.

**(8) ARGUMENT**

**First Claim Grouping: Claim 1 is Not Unpatentable Over the Prior Art**

*Discussion re: Patentability of Claim 1*

1. Claim 1

Claim 1 stands rejected as allegedly being obvious over Madigan in view of the Applicants' Figures (defined below). Claim 1 includes the following limitations:

Claim 1. A method of quantitatively evaluating alternatives to check-out operations using simulation model, comprising:  
selecting from a data input dictionary parameters describing a first check-out operations;  
inputting parameter values for the selected parameters describing the first check-out operations into the simulation model;  
transforming the first check-out operation parameters into check-out performance results; and  
outputting the results from the simulation model.

Thus, the method evaluates alternative scenarios by providing a data input dictionary that is used to select input parameters that are used in a simulation and then inputting values for the selected parameters.

2. The Examiner Has Improperly Relied Upon the Applicants' Specification

The Examiner stated that Madigan teaches methods of using simulation aids in improving processes in the realm of retail, "but doesn't teach how to pursue it." (Office Action at page 6). The Examiner then stated that "Human Factors Engineering ("Lane and Front-End Effectiveness Model" (1999))" taught the actual model claimed. (Office Action at page 6). The Examiner has improperly relied upon the Applicants' specification to reject claim 1.



Specifically, in response to the Examiner's objections to the drawings originally submitted with the Applicants' application, the Applicants submitted 23 sheets of replacement drawings that included changes to FIGs. 1 and 4-25 in an Amendment dated March 30, 2004 (the "Applicants' Figures"). In response, the Examiner withdrew his objections. (Office Action at page 3). The Examiner then cited the Applicants' Figures as prior art against claim 1. (Office Action at page 6).<sup>1</sup> This is clearly evidenced by comparing the FIGs. 4-25 originally filed with the Applicants' application (copies of which are attached hereto as Exhibit I) with the FIGs. 4-25 labeled by the Examiner as "Human Factors Engineering ("Lane and Front-End Effectiveness Model" (1999))" (copies of which are attached hereto as Exhibit II). Therefore, the "Human Factors Engineering ("Lane and Front-End Effectiveness Model" (1999))" figures are the corrected version of the Applicants' figures 4-25.

There are circumstances wherein representations by an applicant allow subject matter to be used as prior art against the applicant's claims. For example, admissions by an applicant during prosecution of an application identifying work as prior art acts as an admission that the work is prior art against the claims. (MPEP at § 2129). Moreover, identification of subject matter within a specification as prior art allows the subject matter to be used (with certain exceptions) as prior art against the claims. (Id. at § 2129). However, the Examiner has identified no such basis for using the Applicants' Figures as prior art against the Applicants' claims. Moreover, the Applicants are not aware of any such basis. In fact, the specification clearly states that "[t]he present invention is illustrated ... in the figures of the accompanying drawings". (Specification at page 6,

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<sup>1</sup> The date ascribed to the Applicants' Figures in the Office Action is apparently based upon FIG. 14, which includes a February 1999 date.

lines 3-4). Thus, the specification clearly identifies the Applicants' Figures as showing the present invention and not as showing the prior art. Therefore, the Applicants' Figures are not available as prior art against claim 1.

Thus, because the Examiner has admitted that Madigan does not teach all of the limitations of claim 1, and because the Applicants' Figures are not available as prior art against claim 1, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 1. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 1.

3. Madigan has been Mischaracterized

In rejecting claim 1, the Examiner has apparently interpreted the preamble to include limitations on the scope of the claim, and alleged that Madigan discloses the limitations in the preamble. (Office Action at page 7). The Examiner has mischaracterized Madigan.

Specifically, the Examiner alleged that Madigan discloses the recitation in the preamble of "quantitatively evaluating alternatives to check-out operations" citing to Madigan at page 1276, section 3.1, first paragraph. (Office Action at page 7). Madigan does describe that the model of Madigan includes up to 37 different checkout scenarios. (Madigan at page 1277, section 3.1). However, Madigan does not disclose the use of the model for analyzing *alternative* scenarios. For example, section 3.3 of Madigan discusses how the model was validated using field studies. However, validating a model against an *actual* retail setting is not an analysis of *alternatives* to the retail setting.

Thus, Madigan does not teach “quantitatively evaluating alternatives to check-out operations” as recited in the preamble of claim 1. Accordingly, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 1. Therefore, the Board of Appeals is respectfully requested to reverse this rejection of claim 1.

4. The Proposed Modification Does Not Arrive at the Claimed Invention

The Examiner proposes modifying Madigan to include elements shown in FIG. 4 of the Applicants’ Figures. Assuming *arguendo* that such a use of the Applicants’ Figures is permissible, the proposed modification does not arrive at the invention of claim 1.

Specifically, claim 1 recites the step “selecting from a data input dictionary parameters describing a first check-out operations”. A data input dictionary limits and defines parameters that may be input by a user to define a scenario. (See e.g. Specification at page 12, lines 4-5). Thus, while a data input dictionary may be used to define a scenario, a data input dictionary is not the same thing as a scenario. The Examiner alleges that such a data input library is disclosed either in Madigan at page 1277, left column, first paragraph, lines 3-4 or FIG. 4 of the Applicants’ Figures. (Office Action at page 7).

The section of Madigan relied upon by the Examiner states that “[a] total of 37 different checkout scenarios were possible.” (Madigan at page 1277, left column, first paragraph, lines 3-4). However, as discussed above, a *scenario* is not a *data input dictionary*. Moreover, Madigan does not disclose *how* the scenarios are defined or the

manner in which the input for the scenarios is selected by a user. Therefore, Madigan does not disclose the recited data input dictionary.

To the extent that the Examiner intended to rely upon FIG. 4 of the Applicants' Figures as teaching or suggesting a data input dictionary, there is no specific mention of a "data input dictionary" in FIG. 4 of the Applicants' Figures. FIG. 4 of the Applicants' Figures does show that one embodiment of the Applicants' invention includes an "Input Module". Accordingly, the Examiner's rejection may be based upon an unstated argument that an "input module" inherently discloses a data input dictionary.

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The Examiner has failed to provide any evidence or technical reasoning to show that all input modules necessarily include a data input dictionary.

Therefore, because Madigan does not disclose a data input dictionary and because the Examiner has failed to show that an "input module" is necessarily a "data input dictionary", a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 1. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 1.

5. Conclusion as to Claim 1

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 1.

**Second Claim Grouping: Claims 3, 7, 9-15 and 17-26 are Not Unpatentable  
Over the Prior Art**

*Discussion re: Patentability of Claims 3, 7, 9-15 and 17-26*

1. The Proposed Modification Does Not Arrive at the Claimed Invention

Claims 3, 7, 9-15 and 17-26 depend from claim 1 either directly or by way of one or more intermediate claims and incorporate the limitations of claim 1. The Examiner rejected claims 3, 7, 9-15 and 17-26 alleging that the limitations added by the claims 3, 7, 9-15 and 17-26 were found in Madigan and the Applicants' Figures. However, even assuming the limitations added by claims 3, 7, 9-15 and 17-26 are disclosed in the cited prior art, the proposed modification of Madigan with the Applicants' Figures does not correct the deficiencies of the prior art with respect to the preamble or the data input dictionary limitation discussed above with respect to claim 1. Accordingly, the proposed modification does not arrive at the invention of claims 3, 7, 9-15 and 17-26.

Therefore, for at least the same reasons set forth with respect to the preamble and the data input dictionary limitation of claim 1, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claims 3, 7, 9-15 and 17-26. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claims 3, 7, 9-15 and 17-26.

2. Claims 3, 7, 9-15 and 17-26 Recite Limitations Not Taught by Madigan

Claims 3, 7, 9-15 and 17-26 include limitations in addition to those set forth in claim 1. However, the Examiner relied solely upon the Applicants' Figures in alleging that the additional limitations were taught by the prior art.<sup>2</sup> Therefore, because the Applicants' Figures are not available as prior art against the claims for the reasons discussed above with respect to claim 1, and because the Examiner has not identified any teaching in Madigan that discloses the additional limitations of claims 3, 7, 9-15 and 17-26, the Examiner has failed to identify each of the additional limitations of claims 3, 7, 9-15 and 17-26 in the prior art. Thus, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been properly alleged with respect to the invention of claims 3, 7, 9-15 and 17-26. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claims 3, 7, 9-15 and 17-26.

3. Conclusion as to Claims 3, 7, 9-15 and 17-26

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claims 3, 7, 9-15 and 17-26.

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<sup>2</sup> In the Office Action, the Examiner identified the limitations of claims 9 and 10 as being taught by Madigan. (Office Action at pages 8 and 9). Madigan does not include a Fig. 8 or a FIG. 9 as cited in the Office Action; however, the Applicants' Figures do. Accordingly, it appears the Examiner mistakenly referred to Madigan when intending to rely upon the Applicants' Figures.

**Third Claim Grouping: Claim 4 is Not Unpatentable Over the Prior Art**

*Discussion re: Patentability of Claim 4*

1. The Arguments Regarding Claim 1 Apply to Claim 4

Claim 4 depends from claim 1 and incorporates the limitations of claim 1. The Examiner rejected claim 4 based for the same reasons relying upon the same combination of Madigan and the Applicants' Figures discussed above with respect to claim 1. Therefore, for at least the same reasons set forth with respect to claim 1, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 4. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 4.

2. The Examiner Has Failed to Allege Prima Facie Obviousness

Claim 4 includes the limitation of a check-out operation that includes "check stand designs, transaction procedures and lane configurations". The Examiner has failed to allege that this limitation is taught by Madigan or the Applicants' Figures. (Office Action at page 7). Under MPEP § 2142, the prior art must teach or suggest all of the claim limitations. Therefore, because the Examiner has failed to identify the "check stand designs, transaction procedures and lane configurations" recited in claim 4 in any prior art, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been properly alleged with respect to the invention of claim 4. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 4.

3. Conclusion as to Claim 4

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 4.

**Fourth Claim Grouping: Claim 5 is Not Unpatentable Over the Prior Art**

*Discussion re: Patentability of Claim 5*

1. The Proposed Modification Does Not Arrive at the Claimed Invention

Claim 5 depends from claim 1 and incorporates the limitations of claim 1. The Examiner rejected claim 5 alleging that the limitations added by claim 5 were found in Madigan and the Applicants' Figures. However, even assuming the limitations added by claim 5 are disclosed in the cited prior art, the proposed modification of Madigan with the Applicants' Figures does not correct the deficiencies of the prior art with respect to the preamble or the data input dictionary limitation discussed above with respect to claim 1. Accordingly, the proposed modification does not arrive at the invention of claim 5.

Therefore, for at least the same reasons set forth with respect to the preamble and the data input dictionary limitation of claim 1, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 5. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 5.



2. The Examiner has Failed to Prove Inherency

Claim 5 includes the limitation of a transforming step “performed in either an unlimited arrival mode or a limited arrival mode”. The Examiner rejected claim 5 based upon the proposition that Madigan and/or Fig. 10 of the Applicants’ Figures discloses either an unlimited arrival mode or a limited arrival mode. (Office Action at page 8). FIG. 10 of the Applicants’ Figures is not available as prior art for the reasons set forth above and the Examiner has failed to prove inherent disclosure of the claimed invention in Madigan.

Specifically, the Examiner alleged that the transforming step was disclosed in Madigan at page 1277, section 3.3, first paragraph, lines 13-14. (Office Action at page 8). Madigan discloses that “[t]he model was configured to simulate 24 hours of store operation per day for a two day period.” (Madigan at page 1277, section 3.3, first paragraph, lines 13-14). However, Madigan does not specifically identify the claimed “unlimited arrival mode or a limited arrival mode” transformation. Thus, the Examiner has apparently alleged that a store operation simulation inherently includes *either* an unlimited arrival mode or a limited arrival mode. However, the Examiner has failed to provide any evidence or technical reasoning to show that all store operation simulations necessarily include an arrival mode limitation much less an arrival mode that is *either* an unlimited arrival mode or a limited arrival mode.

Therefore, because FIG. 10 of the Applicants’ Figures is not available as prior art and because the Examiner has failed to prove that a store operation simulation necessarily includes the transformation step recited in claim 5, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 5.

Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 5.

3. Conclusion as to Claim 5

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 5.

**Fifth Claim Grouping: Claim 6 is Not Unpatentable Over the Prior Art**

*Discussion re: Patentability of Claim 6*

1. The Proposed Modification Does Not Arrive at the Claimed Invention

Claim 6 depends from claim 1 and incorporates the limitations of claim 1. The Examiner rejected claim 6 alleging that the limitations added by claim 6 were found in Madigan and the Applicants' Figures. However, even assuming the limitations added by claim 6 are disclosed in the cited prior art, the proposed modification of Madigan with the Applicants' Figures does not correct the deficiencies of the prior art with respect to the preamble or the data input dictionary limitation discussed above with respect to claim 1. Accordingly, the proposed modification does not arrive at the invention of claim 6.

Therefore, for at least the same reasons set forth with respect to the preamble and the data input dictionary limitation of claim 1, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 6. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of

claim 6.

2. The Examiner has Mischaracterized Madigan

Claim 6 includes the limitation of a simulation that includes check-out operations parameters describing “pre-itemization, itemization, finalization, bagging and intervention”. The Examiner rejected claim 6 based upon the proposition that Madigan discloses the above check-out parameters. (Office Action at page 8). The Examiner has mischaracterized Madigan.

Specifically, the Examiner alleged that the above parameters were disclosed in Madigan at page 1277, section 3.1. (Office Action at page 8). Madigan discloses that “[t]he model was configured to allow the input of tendering, labor, and merchandise purchased.” (Madigan at page 1277, section 3.1). Moreover, although not cited by the Examiner, Madigan does disclose unloading, itemization, finalization and bagging. (Id at page 1276, section 3.1). Thus, Madigan arguably discloses a model that includes pre-itemization, itemization, finalization and bagging described by parameters as recited in claim 6. However, claim 6 further recites that the parameters describe “intervention”. As stated in the specification, intervention “[r]equires a super helper to resolve a transaction problem at a checkstand.” (Specification at page 14). Section 3.1 does not appear to include any teaching of “intervention”. In fact, Applicants are not aware that Madigan even discusses transaction problems at a check stand, much less the use of super helpers to resolve the problems.

Therefore, because Madigan does not disclose parameters that describe “intervention” as recited in claim 6, a *prima facie* case of obviousness under 35 U.S.C. §

103 has not been established with regard to the invention of claim 6. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 6.

3. Conclusion as to Claim 6

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 6.

**Sixth Claim Grouping: Claim 8 is Not Unpatentable Over the Prior Art**

*Discussion re: Patentability of Claim 8*

1. The Proposed Modification Does Not Arrive at the Claimed Invention

Claim 8 depends by way of claim 7 from claim 1 and incorporates the limitations of claim 1 and claim 7. The Examiner rejected claim 8 alleging that the limitations added by claim 8 were found in Madigan and the Applicants' Figures. However, even assuming the limitations added by claim 8 are disclosed in the cited prior art, the proposed modification of Madigan with the Applicants' Figures does not correct the deficiencies of the prior art with respect to the preamble or the data input dictionary limitation discussed above with respect to claim 1. Accordingly, the proposed modification does not arrive at the invention of claim 8.

Therefore, for at least the same reasons set forth with respect to the preamble and the data input dictionary limitation of claim 1, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 8.

Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 8.

2. The Examiner has Mischaracterized Madigan

Claim 8 includes the limitation of a simulation that includes labor at front-end operations including “cashiers, baggers, super-helpers and overflow resources”. The Examiner rejected claim 8 based upon the proposition that the Applicants’ Figure 12 and/or Madigan disclose the above labor types.<sup>3</sup> (Office Action at page 8). FIG. 12 of the Applicants’ Figures is not available as prior art for the reasons set forth above and the Examiner failed to prove inherent disclosure of the claimed invention in Madigan.

Specifically, the Examiner alleged the above recited labor types were disclosed in Madigan at page 1276, section 3.1, lines 1-13. (Office Action at page 8). Madigan discloses the high level task categories in the model of Madigan in section 3.1. (Madigan at page 1276, section 3.1). The task categories include a reference that a “cashier unloads items” and that one task category is “bagging”. Moreover, Madigan discloses that one input that is allowed is “labor”. (Madigan at page 1277, section 3.1). Thus, while Madigan arguably discloses a model that includes a labor type of “cashiers”, there is no mention in Madigan of labor types such as baggers, super helpers or overflow resources as recited in claim 8.

To the extent the Examiner may have intended to allege that a model of a check-out process inherently includes labor groups such as baggers, super helpers or overflow resources, the Examiner has failed to provide any evidence or technical reasoning to

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<sup>3</sup> The Examiner has incorrectly cited Madigan and the Applicants’ Figures in the Office Action. Specifically, the page 1276 reference is found in Madigan and FIG. 12 is found in the Applicants’ Figures.

show that all check-out process models necessarily include labor types, much less labor types such as baggers, super helpers or overflow resources.

Therefore, because FIG. 12 of the Applicants' Figures is not available as prior art and because the Examiner has failed to show that check-out process models necessarily include the labor groups of baggers, super helpers and overflow resources as recited in claim 8, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 8. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 8.

3. Conclusion as to Claim 8

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 8.

**Seventh Claim Grouping: Claim 16 is Not Unpatentable Over the Prior Art**

*Discussion re: Patentability of Claim 16*

1. The Proposed Modification Does Not Arrive at the Claimed Invention

Claim 16 depends by way of intermediate claims from claim 1 and incorporates the limitations of claim 1. The Examiner rejected claim 16 alleging that the limitations added by claim 16 were found in Madigan. However, even assuming the limitations added by claim 8 are disclosed in the cited prior art, the limitation of claim 16 does not correct the deficiencies of the prior art with respect to the preamble or the data input

dictionary limitation discussed above with respect to claim 1. Accordingly, the proposed combination does not arrive at the invention of claim 16.

Therefore, for at least the same reasons set forth with respect to the preamble and the data input dictionary limitation of claim 1, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 16. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 16.

2. The Examiner has Mischaracterized Madigan

Claim 16 includes the limitation that transaction itemization parameters input to a model include scalar values with “a mean and a standard [deviation] event time distribution of an event time distribution”. The Examiner rejected claim 16 based upon the proposition that Madigan discloses the above recited transaction itemization parameters. (Office Action at page 10). The Examiner has mischaracterized Madigan.

Specifically, the Examiner alleged that the transaction itemization parameters are disclosed in Madigan at page 1277, section 3.12. (Office Action at page 8). Madigan discloses that a simulation was run and “the overall major task category totals were examined” and that “[t]he average task times for each of these categories were within one standard deviation” of field study values. (Madigan at page 1277, section 3.2). Thus, the output described by Madigan appears to be a discreet value that was within a standard deviation of actual measured values. Accordingly, the only “model” parameter in the cited passage is the *output* of the model. Therefore, the Examiner has alleged that the discreet *output* of Madigan discloses the mean and standard deviation event time

distribution *inputs* recited in claim 8. There is no basis for such an allegation. A discreet *output* is not a mean and standard deviation event time distribution *input*.

Therefore, because Madigan does not disclose transaction itemization parameters input to a model including scalar values with “a mean and a standard [deviation] event time distribution of an event time distribution” as recited in claim 16, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 16. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 16.

3. Conclusion as to Claim 16

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 16.

**Eighth Claim Grouping: Claims 27-31 are Not Unpatentable  
Over the Prior Art**

*Discussion re: Patentability of Claim 27*

1. Claim 27

Claim 27 stands rejected as allegedly being obvious over Madigan in view of the Applicants’ Figures. Claim 27 includes the following limitations:

Claim 27. A method of predicting, with a simulation model programmed to accept parameters within a predetermined range, performance characteristics of a prospective check-out system for use in planning and designing a check-out system comprising:  
selecting a check-out configuration;



determining parameters within the predetermined range that describe the check-out configuration;  
inputting the parameters describing the checkout configuration into the simulation model;  
determining parameters within the predetermined range that describe customer demand;  
inputting the parameters describing the customer demand into the simulation model;  
transforming the customer demand parameters and the check-out configuration parameters into checkout configuration performance; and  
outputting information regarding the checkout configuration performance from the simulation model.

Thus, a simulation model is used to predict performance characteristics by selecting a check-out configuration to be modeled, inputting parameters that are within a predetermined range that describe customer demand and check-out configuration, transforming the inputs and outputting information.

2. The Examiner Has Improperly Relied Upon the Applicants' Disclosure

The Examiner alleged that Madigan in combination with the Applicants' Figures disclose limitations in the preamble of claim 27. (Office Action at page 13). However, the Examiner relied solely upon FIG. 20 of the Applicants' Figures for the proposition that the steps of claim 27 were disclosed in prior art. (Office Action at page 13). As set forth above, the Applicants' Figures are not available as prior art against the claims. Thus, the Examiner has failed to identify any of the steps of claim 27 in available prior art.

Therefore, because the Examiner has failed to identify each of the limitations of claim 27 in the prior art, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 27. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 27.

3. The Proposed Modification Does Not Arrive At the Claimed Invention

Moreover, even assuming *arguendo* that the Applicants' Figures are available as prior art, the proposed modification does not arrive at the claimed invention. Claim 27 recites "determining parameters within the predetermined range that describe the check-out configuration". Accordingly, a predetermined range must exist in the simulation model. FIG. 20 of the Applicants' Figures does not disclose a predetermined range. Rather, FIG. 20 states that a scenario is created "by entering parameter values". Clearly, this statement does not necessarily reflect the allegation that such entry is limited to a parameter within a predetermined range.

Therefore, FIG. 20 of the Applicants' Figures does not disclose entry of parameters restricted to be within a predetermined range. Thus, even assuming *arguendo* that the Applicants' Figures is available as prior art, the proposed modification does not arrive at the invention of claim 27. Accordingly, a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established with regard to the invention of claim 27. Accordingly, the Board of Appeals is respectfully requested to reverse this rejection of claim 27.

3. Conclusion as to Claim 27

Therefore, for any or all of the above reasons, the Examiner has failed to provide a *prima facie* case of obviousness. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claim 27.

*Discussion re: Patentability of Claim 28-31*

Claims 28-31 also stand rejected as allegedly being obvious over Madigan in view of the Applicants' Figures. Claims 28-31 depend from claim 27. Therefore, Claims 28-31 include all of the limitations of claim 27 and other limitations. Thus, for at least the same reasons as those set forth above in connection with claim 27, it is respectfully submitted that claims 28-31 are patentable over the prior art. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of claims 28-31.

**(9) CONCLUSION**

For all of the foregoing reasons, claims 1, 3-18 and 20-31 are not unpatentable under 35 U.S.C. § 103(a). As a consequence, the Board of Appeals is respectfully requested to reverse the rejection of these claims.

Respectfully submitted,  
MAGINOT, MOORE & BECK LLP



James D. Wood  
Attorney for Applicants  
Attorney Registration No. 43,285

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Maginot Moore & Beck LLP  
Bank One Tower/Center  
111 Monument Circle, Suite 3000  
Indianapolis, Indiana 46204-5115  
Telephone: (317) 638-2922  
Facsimile: (317) 638-2139

## CLAIM APPENDIX

Claim 1. A method of quantitatively evaluating alternatives to check-out operations using simulation model, comprising:

- selecting from a data input dictionary parameters describing a first check-out operations;
- inputting parameter values for the selected parameters describing the first check-out operations into the simulation model;
- transforming the first check-out operation parameters into check-out performance results; and
- outputting the results from the simulation model.

Claim 3. The method of claim 1, wherein the first check-out operations includes one of a transaction process at two front facing check stands, a transaction process at two back-to-back check stands and a transaction process at two front facing check stands for fast-track customers.

Claim 4. The method of claim 1, wherein the first check-out operations include check stand designs, transaction procedures and lane configurations.

Claim 5. The method of claim 1, wherein the transforming step is performed in either an unlimited arrival mode or a limited arrival mode.

Claim 6. The method of claim 1, wherein the simulation model simulates two lane models using check-out operations parameters describing the following events: pre-itemization, itemization, finalization, bagging and intervention.

Claim 7. The method of claim 1, wherein the first check-out operations represent front-end operations of a check-out process.

Claim 8. The method of claim 7, wherein the front-end operations has labor including cashiers, baggers, super-helpers and overflow resources.

Claim 9. The method of claim 1, wherein the first check-out operations parameters comprise a configuration category, a customer demand category, a schedule category, a transaction category, a transaction itemization category, a transaction finalization category, a transaction bagging category, a transaction intervention category, and a model parameters category.

Claim 10. The method of claim 9, wherein the configuration category includes parameters defining the length of and resources in a scenario.

Claim 11. The method of claim 10, wherein the resources include a number and type of check-stands and belt size.

Claim 12. The method of claim 9, wherein the customer demand category has parameters that control the workload on a front-end or lane.

Claim 13. The method of claim 12, wherein the parameters that control the workload include a number of customer arrivals and customer basket sizes.

Claim 14. The method of claim 9, wherein the schedules category includes schedules for cashier, bagger and super-helper in 30 minute intervals during a scenario.

Claim 15. The method of claim 9, wherein the transaction itemization parameters are scalar values.

Claim 16. The method of claim 15, wherein the scalar parameters are a mean and a standard event time distribution of an event time distribution.

Claim 17. The method of claim 9, wherein the transaction bagging category includes parameters which govern how long it takes to bag items and which resources are available for bagging.

Claim 18. The method of claim 9, wherein the model parameters include a number of replications, a stream number identifier and check input option identifier.

Claim 20. The method of claim 1, wherein the data input dictionary comprises at least one allowable range of parameter values, and wherein the inputting step comprises inputting a parameter value within the allowed range.

Claim 21. The method of claim 1, comprising one of outputting a report and displaying an animation of the results of the simulation.

Claim 22. The method of claim 1, further comprising:  
selecting from a data input dictionary parameters describing a second check-out operations;  
inputting parameter values for the selected parameters describing the second check-out operations into the simulation model;  
transforming the second check-out operations parameters into alternative check-out performance results; and  
outputting the alternative results from the simulation model.

Claim 23. The method of claim 1, wherein the first check-out operations comprise a plurality of resource types, and wherein the results of said outputting step includes performance measures for each type of resource.

Claim 24. The method of claim 23, wherein the first check-out operations comprise a front-end model and wherein the output results include one of: all measures; baggers; cashiers; regular lanes; fast-track lanes; self-service lanes, self service convertible to cashier operated lanes, overall front-end; super-helpers; and express lanes.

Claim 25. The method of claim 23, wherein the first check-out operations comprise a two lane model and wherein the output results include one of: all measures; customer; cashier; lane; and bagger.

Claim 26. The method of claim 23, wherein the performance measures include an average, standard error, a minimum and a maximum value for each performance measure.

Claim 27. A method of predicting, with a simulation model programmed to accept parameters within a predetermined range, performance characteristics of a prospective check-out system for use in planning and designing a check-out system comprising:

- selecting a check-out configuration;
- determining parameters within the predetermined range that describe the check-out configuration;
- inputting the parameters describing the checkout configuration into the simulation model;
- determining parameters within the predetermined range that describe customer demand;
- inputting the parameters describing the customer demand into the simulation model;
- transforming the customer demand parameters and the check-out configuration parameters into checkout configuration performance; and
- outputting information regarding the checkout configuration performance from the simulation model.

Claim 28. The method of claim 27, wherein the check-out configuration comprises a plurality of check stands, and wherein the step of determining parameters describing the checkout configuration comprises the step of:

- determining for each of the plurality of check stands, at least one parameter that describes the check stand, and wherein the step of inputting the parameters describing the checkout configuration into the simulation model comprises the step of:

inputting the at least one parameter that describes the check stand for each of the plurality of check stands, and wherein the step of transforming comprises the step of:

transforming the customer demand parameters and the check-out configuration parameters into check stand performance for each of the plurality of check stands, and wherein the step of outputting information comprises the step of:

outputting information regarding the checkout configuration performance for each of the plurality of check stands, such that a comparison of the relative performance of each of the plurality of check stands is facilitated.

Claim 29. The method of claim 28, wherein each of the plurality of check stands comprises a check stand of a different type, and wherein the step of outputting information comprises the step of:

outputting information regarding the checkout configuration performance for each type of the plurality of check stands, such that a comparison of the relative performance of each type of the plurality of check stands is facilitated.

Claim 30. The method of claim 27, wherein the check-out configuration comprises a plurality of labor types, and wherein the step of determining parameters describing the checkout configuration comprises the step of:

determining for each of the plurality of labor types, at least one parameter that describes the labor type, and wherein the step of inputting the parameters describing the checkout configuration into the simulation model comprises the step of:

inputting the at least one parameter that describes the labor type for each of the plurality of labor types, and wherein the step of transforming comprises the step of:

transforming the customer demand parameters and the check-out configuration parameters into labor type performance for each of the plurality of labor types, and wherein the step of outputting information comprises the step of:

outputting information regarding the checkout configuration performance for each of the plurality of labor types, such that a comparison of the relative performance of each of the plurality of labor types is facilitated.



Claim 31. The method of claim 30, wherein the plurality of labor types comprise cashiers, baggers and super-helpers, and wherein the step of outputting information comprises the step of:

outputting information regarding the checkout configuration performance for cashiers, baggers and super-helpers, such that a comparison of the relative performance of the cashiers, baggers and super-helpers is facilitated.

400 →

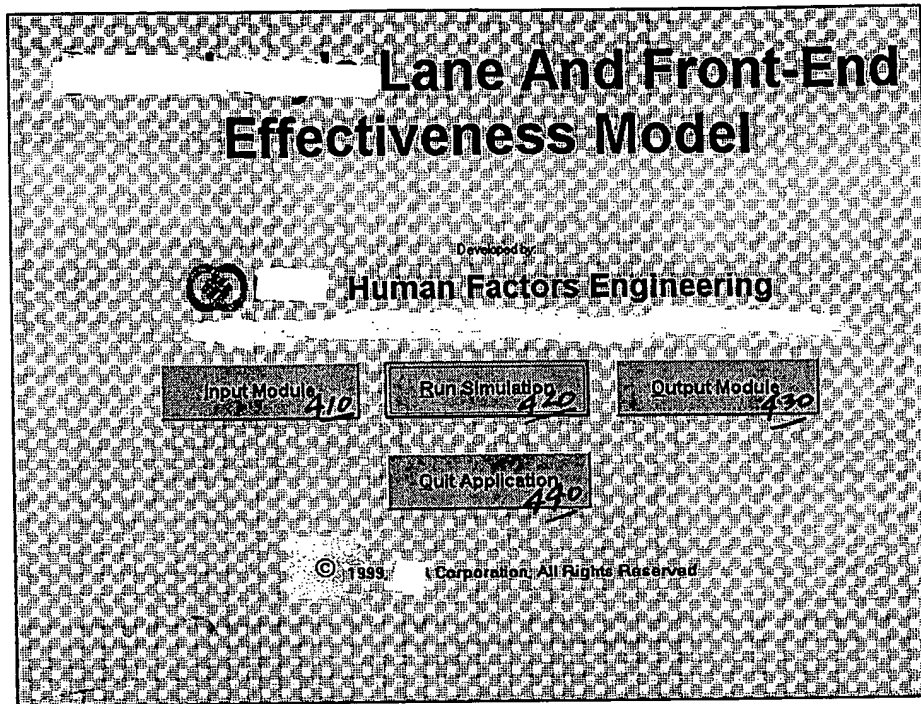


FIG. 4

500 →

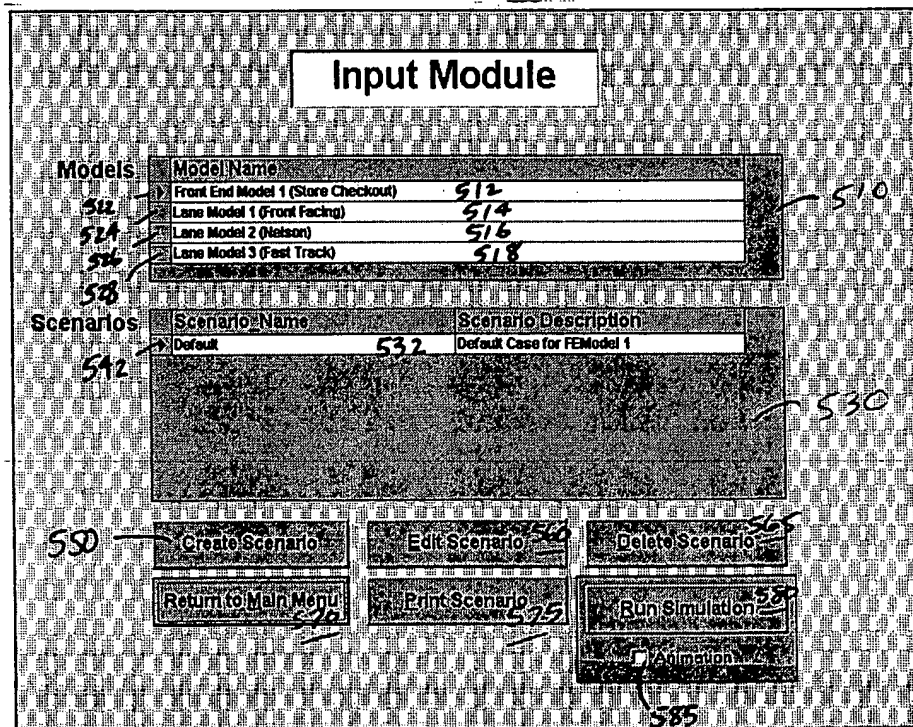


FIG. 5

## Create Parameter File

Model Name  
Front End Model 1 (Store Checkout)

Please Select the Scenario You Want to Clone

Scenario Name	Scenario Description
Default	Default Case for FEModel 1

Please Type Scenario Name and Description in the Text Boxes Below

Scenario Name  
Test 1

Scenario Description  
Add 4 checkstands: 1 Express & 3 Regular

Create and Return
Return Without Creating

FIG. 6

## Input Module

**Models**

722 →

724 →

726 →

728 →

**Scenarios**

732 →

750 →

Model Name	Model ID
Front End Model 1 (Store Checkout)	712
Lane Model 1 (Front Facing)	714
Lane Model 2 (Nelson)	716
Lane Model 3 (Fast Track)	718

Scenario Name	Scenario Description
Default	Default Case for FEModel 1
Test 1	Add 4 Checkstands: 1 Express & 3 Regular

Create Scenario
Edit Scenario
Delete Scenario

Return to Main Menu
Print Scenario
Run Simulation

Animation

FIG. 7

### Edit Parameter File

Model Name: Front End Model 1 (Store Checkout)      Scenario Name: Test 1

Parameter Categories

Transaction  
Minimization 822

Transaction  
Restriction 824

Transaction  
Caching 826

Transaction  
Intervention 828

Configuration 829

Customer  
Demand 831

Schedules 834

Model  
Parameters 836

Lane Type

☐ A

☐ B

☐ C

☐ D

☐ All

Parameter <span style="font-size: small;">850</span>	Value <span style="font-size: small;">855</span>	Range <span style="font-size: small;">860</span>	Description <span style="font-size: small;">865</span>
Start time of the simulation scenario (hours)	6	0 to 24 (hours)	Start time of the simulation scenario in hour from midnight
End time of the simulation scenario (hours)	23	0 to 24 (hours)	End time of the simulation scenario in hours from midnight. End time must be greater than Start time
Number of Fast-Track lanes	1	0 to 47	Number of Fast-Track lanes at the front-end. The total number of all lanes cannot exceed 48
Number of Express lanes	3	0 to 47	Number of Express lanes at the front-end. The total number of all lanes cannot exceed 48
Number of Regular lanes	13	1 to 48	Number of Regular lanes at the front-end. The total number of all lanes cannot exceed 48

Return to Input Form

FIG. 8

### Edit Parameter File

Model Name: Lane Model 2 (Nelson)      Scenario Name: Default

Parameter Categories

Transaction  
Minimization 928

Transaction  
Restriction 924

Transaction  
Caching 926

Transaction  
Intervention 928

Configuration 930

Customer  
Demand 932

Schedules 934

Model  
Parameters 936

Lane #

☐ 1

☐ 2

☐ 3

☐ All

Parameter <span style="font-size: small;">950</span>	Value <span style="font-size: small;">955</span>	Range <span style="font-size: small;">960</span>	Description <span style="font-size: small;">965</span>
Time length of scenario	60	0.0 to 1440.0 (minutes)	Length of the simulation scenario in minutes
Number of baggers	1	0, 1, or 2	Number of baggers; options are 0 baggers, 1 bagger for both lanes, or 2 baggers - one for each lane
Maximum number of items on front belt	20	1 to 200	Maximum number of items on front belt
Maximum number of items in bagging area	20	1 to 200	Maximum number of items on back belt and bagging area
Probability of basket icon	0.5	0.0 to 1.0	Probability a customer uses a basket (vs. cart) when their

Return to Input Form

FIG. 9

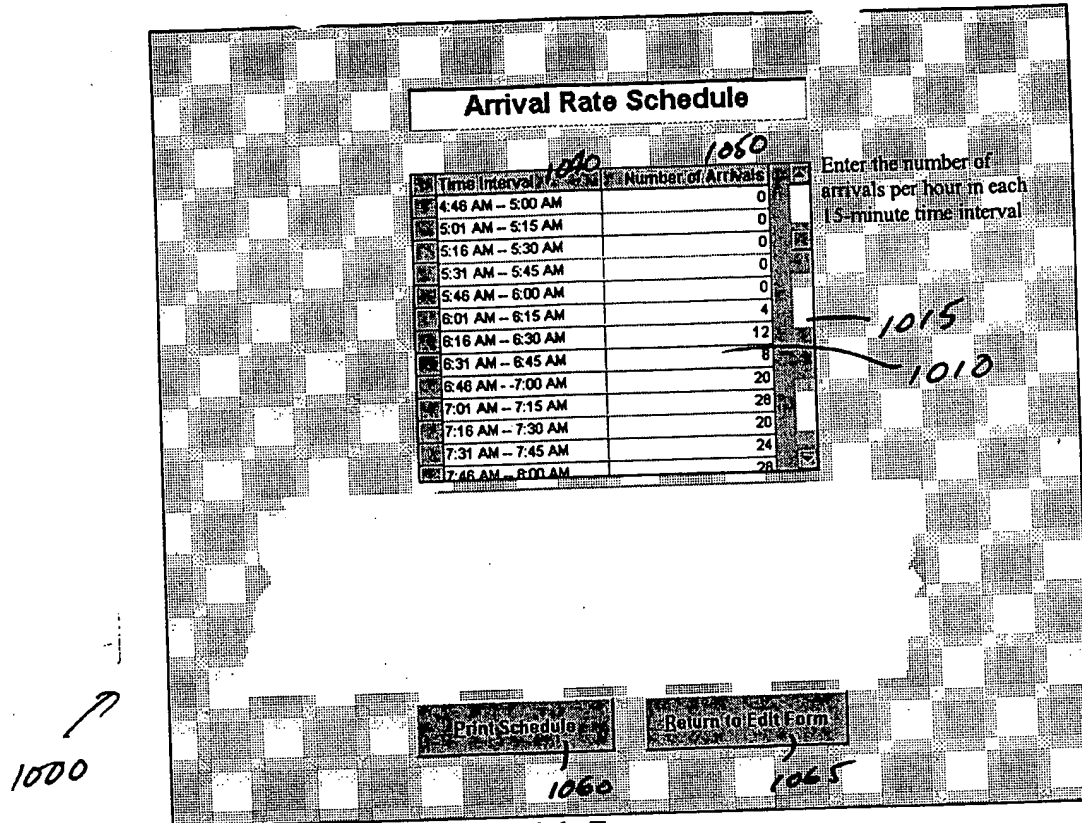


FIG. 10

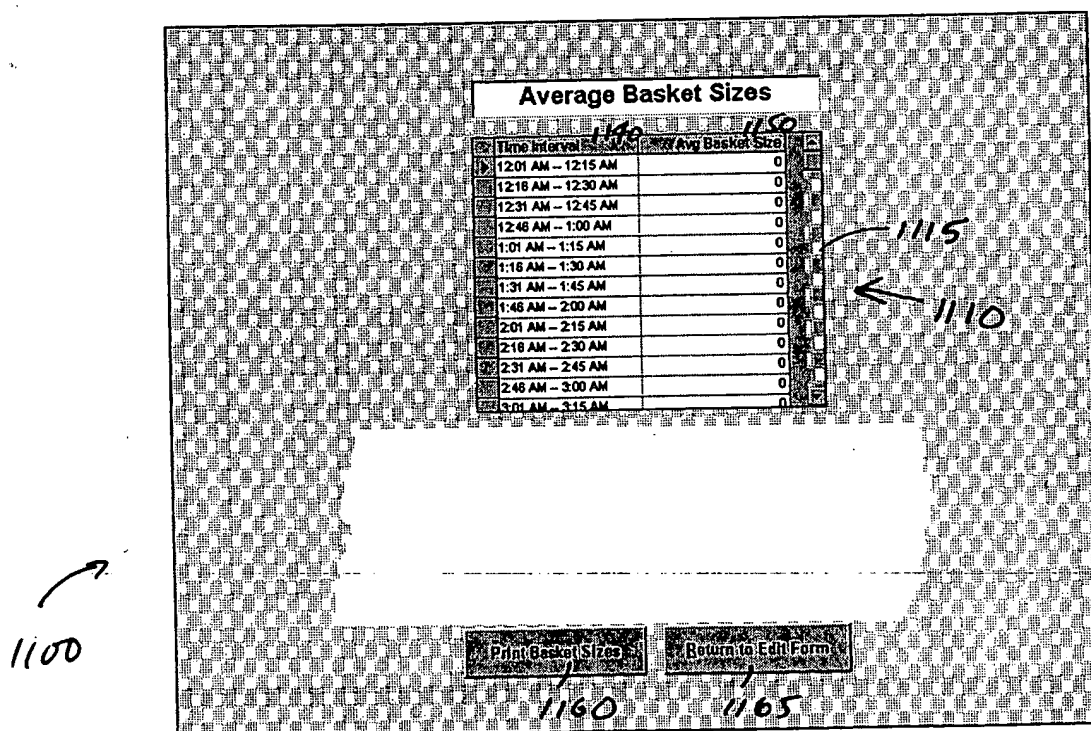


FIG. 11



**Schedules**

1220 ☐ 1225 ☐ 1230 ☐ 1235 ☐ 1240 ☐ 1245 ☐ 1250 ☐ 1255 ☐ 1260 ☐ 1265 ☐ 1270 ☐ 1275 ☐ 1280 ☐ 1285 ☐ 1290 ☐ 1295 ☐ 1300 ☐ 1305 ☐ 1310 ☐ 1315 ☐ 1320 ☐ 1325 ☐ 1330 ☐ 1335 ☐ 1340 ☐ 1345 ☐ 1350 ☐ 1355 ☐ 1360 ☐ 1365 ☐ 1370 ☐ 1375 ☐ 1380 ☐ 1385 ☐ 1390 ☐ 1395 ☐ 1400 ☐ 1405 ☐ 1410 ☐ 1415 ☐ 1420 ☐ 1425 ☐ 1430 ☐ 1435 ☐ 1440 ☐ 1445 ☐ 1450 ☐ 1455 ☐ 1460 ☐ 1465 ☐ 1470 ☐ 1475 ☐ 1480 ☐ 1485 ☐ 1490 ☐ 1495 ☐ 1500 ☐ 1505 ☐ 1510 ☐ 1515 ☐ 1520 ☐ 1525 ☐ 1530 ☐ 1535 ☐ 1540 ☐ 1545 ☐ 1550 ☐ 1555 ☐ 1560 ☐ 1565 ☐ 1570 ☐ 1575 ☐ 1580 ☐ 1585 ☐ 1590 ☐ 1595 ☐ 1600 ☐ 1605 ☐ 1610 ☐ 1615 ☐ 1620 ☐ 1625 ☐ 1630 ☐ 1635 ☐ 1640 ☐ 1645 ☐ 1650 ☐ 1655 ☐ 1660 ☐ 1665 ☐ 1670 ☐ 1675 ☐ 1680 ☐ 1685 ☐ 1690 ☐ 1695 ☐ 1700 ☐ 1705 ☐ 1710 ☐ 1715 ☐ 1720 ☐ 1725 ☐ 1730 ☐ 1735 ☐ 1740 ☐ 1745 ☐ 1750 ☐ 1755 ☐ 1760 ☐ 1765 ☐ 1770 ☐ 1775 ☐ 1780 ☐ 1785 ☐ 1790 ☐ 1795 ☐ 1800 ☐ 1805 ☐ 1810 ☐ 1815 ☐ 1820 ☐ 1825 ☐ 1830 ☐ 1835 ☐ 1840 ☐ 1845 ☐ 1850 ☐ 1855 ☐ 1860 ☐ 1865 ☐ 1870 ☐ 1875 ☐ 1880 ☐ 1885 ☐ 1890 ☐ 1895 ☐ 1900 ☐ 1905 ☐ 1910 ☐ 1915 ☐ 1920 ☐ 1925 ☐ 1930 ☐ 1935 ☐ 1940 ☐ 1945 ☐ 1950 ☐ 1955 ☐ 1960 ☐ 1965 ☐ 1970 ☐ 1975 ☐ 1980 ☐ 1985 ☐ 1990 ☐ 1995 ☐ 2000 ☐ 2005 ☐ 2010 ☐ 2015 ☐ 2020 ☐ 2025 ☐ 2030 ☐ 2035 ☐ 2040 ☐ 2045 ☐ 2050 ☐ 2055 ☐ 2060 ☐ 2065 ☐ 2070 ☐ 2075 ☐ 2080 ☐ 2085 ☐ 2090 ☐ 2095 ☐ 2100 ☐ 2105 ☐ 2110 ☐ 2115 ☐ 2120 ☐ 2125 ☐ 2130 ☐ 2135 ☐ 2140 ☐ 2145 ☐ 2150 ☐ 2155 ☐ 2160 ☐ 2165 ☐ 2170 ☐ 2175 ☐ 2180 ☐ 2185 ☐ 2190 ☐ 2195 ☐ 2200 ☐ 2205 ☐ 2210 ☐ 2215 ☐ 2220 ☐ 2225 ☐ 2230 ☐ 2235 ☐ 2240 ☐ 2245 ☐ 2250 ☐ 2255 ☐ 2260 ☐ 2265 ☐ 2270 ☐ 2275 ☐ 2280 ☐ 2285 ☐ 2290 ☐ 2295 ☐ 2300 ☐ 2305 ☐ 2310 ☐ 2315 ☐ 2320 ☐ 2325 ☐ 2330 ☐ 2335 ☐ 2340 ☐ 2345 ☐ 2350 ☐ 2355 ☐ 2360 ☐ 2365 ☐ 2370 ☐ 2375 ☐ 2380 ☐ 2385 ☐ 2390 ☐ 2395 ☐ 2400 ☐ 2405 ☐ 2410 ☐ 2415 ☐ 2420 ☐ 2425 ☐ 2430 ☐ 2435 ☐ 2440 ☐ 2445 ☐ 2450 ☐ 2455 ☐ 2460 ☐ 2465 ☐ 2470 ☐ 2475 ☐ 2480 ☐ 2485 ☐ 2490 ☐ 2495 ☐ 2500 ☐ 2505 ☐ 2510 ☐ 2515 ☐ 2520 ☐ 2525 ☐ 2530 ☐ 2535 ☐ 2540 ☐ 2545 ☐ 2550 ☐ 2555 ☐ 2560 ☐ 2565 ☐ 2570 ☐ 2575 ☐ 2580 ☐ 2585 ☐ 2590 ☐ 2595 ☐ 2600 ☐ 2605 ☐ 2610 ☐ 2615 ☐ 2620 ☐ 2625 ☐ 2630 ☐ 2635 ☐ 2640 ☐ 2645 ☐ 2650 ☐ 2655 ☐ 2660 ☐ 2665 ☐ 2670 ☐ 2675 ☐ 2680 ☐ 2685 ☐ 2690 ☐ 2695 ☐ 2700 ☐ 2705 ☐ 2710 ☐ 2715 ☐ 2720 ☐ 2725 ☐ 2730 ☐ 2735 ☐ 2740 ☐ 2745 ☐ 2750 ☐ 2755 ☐ 2760 ☐ 2765 ☐ 2770 ☐ 2775 ☐ 2780 ☐ 2785 ☐ 2790 ☐ 2795 ☐ 2800 ☐ 2805 ☐ 2810 ☐ 2815 ☐ 2820 ☐ 2825 ☐ 2830 ☐ 2835 ☐ 2840 ☐ 2845 ☐ 2850 ☐ 2855 ☐ 2860 ☐ 2865 ☐ 2870 ☐ 2875 ☐ 2880 ☐ 2885 ☐ 2890 ☐ 2895 ☐ 2900 ☐ 2905 ☐ 2910 ☐ 2915 ☐ 2920 ☐ 2925 ☐ 2930 ☐ 2935 ☐ 2940 ☐ 2945 ☐ 2950 ☐ 2955 ☐ 2960 ☐ 2965 ☐ 2970 ☐ 2975 ☐ 2980 ☐ 2985 ☐ 2990 ☐ 2995 ☐ 3000 ☐ 3005 ☐ 3010 ☐ 3015 ☐ 3020 ☐ 3025 ☐ 3030 ☐ 3035 ☐ 3040 ☐ 3045 ☐ 3050 ☐ 3055 ☐ 3060 ☐ 3065 ☐ 3070 ☐ 3075 ☐ 3080 ☐ 3085 ☐ 3090 ☐ 3095 ☐ 3100 ☐ 3105 ☐ 3110 ☐ 3115 ☐ 3120 ☐ 3125 ☐ 3130 ☐ 3135 ☐ 3140 ☐ 3145 ☐ 3150 ☐ 3155 ☐ 3160 ☐ 3165 ☐ 3170 ☐ 3175 ☐ 3180 ☐ 3185 ☐ 3190 ☐ 3195 ☐ 3200 ☐ 3205 ☐ 3210 ☐ 3215 ☐ 3220 ☐ 3225 ☐ 3230 ☐ 3235 ☐ 3240 ☐ 3245 ☐ 3250 ☐ 3255 ☐ 3260 ☐ 3265 ☐ 3270 ☐ 3275 ☐ 3280 ☐ 3285 ☐ 3290 ☐ 3295 ☐ 3300 ☐ 3305 ☐ 3310 ☐ 3315 ☐ 3320 ☐ 3325 ☐ 3330 ☐ 3335 ☐ 3340 ☐ 3345 ☐ 3350 ☐ 3355 ☐ 3360 ☐ 3365 ☐ 3370 ☐ 3375 ☐ 3380 ☐ 3385 ☐ 3390 ☐ 3395 ☐ 3400 ☐ 3405 ☐ 3410 ☐ 3415 ☐ 3420 ☐ 3425 ☐ 3430 ☐ 3435 ☐ 3440 ☐ 3445 ☐ 3450 ☐ 3455 ☐ 3460 ☐ 3465 ☐ 3470 ☐ 3475 ☐ 3480 ☐ 3485 ☐ 3490 ☐ 3495 ☐ 3500 ☐ 3505 ☐ 3510 ☐ 3515 ☐ 3520 ☐ 3525 ☐ 3530 ☐ 3535 ☐ 3540 ☐ 3545 ☐ 3550 ☐ 3555 ☐ 3560 ☐ 3565 ☐ 3570 ☐ 3575 ☐ 3580 ☐ 3585 ☐ 3590 ☐ 3595 ☐ 3600 ☐ 3605 ☐ 3610 ☐ 3615 ☐ 3620 ☐ 3625 ☐ 3630 ☐ 3635 ☐ 3640 ☐ 3645 ☐ 3650 ☐ 3655 ☐ 3660 ☐ 3665 ☐ 3670 ☐ 3675 ☐ 3680 ☐ 3685 ☐ 3690 ☐ 3695 ☐ 3700 ☐ 3705 ☐ 3710 ☐ 3715 ☐ 3720 ☐ 3725 ☐ 3730 ☐ 3735 ☐ 3740 ☐ 3745 ☐ 3750 ☐ 3755 ☐ 3760 ☐ 3765 ☐ 3770 ☐ 3775 ☐ 3780 ☐ 3785 ☐ 3790 ☐ 3795 ☐ 3800 ☐ 3805 ☐ 3810 ☐ 3815 ☐ 3820 ☐ 3825 ☐ 3830 ☐ 3835 ☐ 3840 ☐ 3845 ☐ 3850 ☐ 3855 ☐ 3860 ☐ 3865 ☐ 3870 ☐ 3875 ☐ 3880 ☐ 3885 ☐ 3890 ☐ 3895 ☐ 3900 ☐ 3905 ☐ 3910 ☐ 3915 ☐ 3920 ☐ 3925 ☐ 3930 ☐ 3935 ☐ 3940 ☐ 3945 ☐ 3950 ☐ 3955 ☐ 3960 ☐ 3965 ☐ 3970 ☐ 3975 ☐ 3980 ☐ 3985 ☐ 3990 ☐ 3995 ☐ 4000 ☐ 4005 ☐ 4010 ☐ 4015 ☐ 4020 ☐ 4025 ☐ 4030 ☐ 4035 ☐ 4040 ☐ 4045 ☐ 4050 ☐ 4055 ☐ 4060 ☐ 4065 ☐ 4070 ☐ 4075 ☐ 4080 ☐ 4085 ☐ 4090 ☐ 4095 ☐ 4100 ☐ 4105 ☐ 4110 ☐ 4115 ☐ 4120 ☐ 4125 ☐ 4130 ☐ 4135 ☐ 4140 ☐ 4145 ☐ 4150 ☐ 4155 ☐ 4160 ☐ 4165 ☐ 4170 ☐ 4175 ☐ 4180 ☐ 4185 ☐ 4190 ☐ 4195 ☐ 4200 ☐ 4205 ☐ 4210 ☐ 4215 ☐ 4220 ☐ 4225 ☐ 4230 ☐ 4235 ☐ 4240 ☐ 4245 ☐ 4250 ☐ 4255 ☐ 4260 ☐ 4265 ☐ 4270 ☐ 4275 ☐ 4280 ☐ 4285 ☐ 4290 ☐ 4295 ☐ 4300 ☐ 4305 ☐ 4310 ☐ 4315 ☐ 4320 ☐ 4325 ☐ 4330 ☐ 4335 ☐ 4340 ☐ 4345 ☐ 4350 ☐ 4355 ☐ 4360 ☐ 4365 ☐ 4370 ☐ 4375 ☐ 4380 ☐ 4385 ☐ 4390 ☐ 4395 ☐ 4400 ☐ 4405 ☐ 4410 ☐ 4415 ☐ 4420 ☐ 4425 ☐ 4430 ☐ 4435 ☐ 4440 ☐ 4445 ☐ 4450 ☐ 4455 ☐ 4460 ☐ 4465 ☐ 4470 ☐ 4475 ☐ 4480 ☐ 4485 ☐ 4490 ☐ 4495 ☐ 4500 ☐ 4505 ☐ 4510 ☐ 4515 ☐ 4520 ☐ 4525 ☐ 4530 ☐ 4535 ☐ 4540 ☐ 4545 ☐ 4550 ☐ 4555 ☐ 4560 ☐ 4565 ☐ 4570 ☐ 4575 ☐ 4580 ☐ 4585 ☐ 4590 ☐ 4595 ☐ 4600 ☐ 4605 ☐ 4610 ☐ 4615 ☐ 4620 ☐ 4625 ☐ 4630 ☐ 4635 ☐ 4640 ☐ 4645 ☐ 4650 ☐ 4655 ☐ 4660 ☐ 4665 ☐ 4670 ☐ 4675 ☐ 4680 ☐ 4685 ☐ 4690 ☐ 4695 ☐ 4700 ☐ 4705 ☐ 4710 ☐ 4715 ☐ 4720 ☐ 4725 ☐ 4730 ☐ 4735 ☐ 4740 ☐ 4745 ☐ 4750 ☐ 4755 ☐ 4760 ☐ 4765 ☐ 4770 ☐ 4775 ☐ 4780 ☐ 4785 ☐ 4790 ☐ 4795 ☐ 4800 ☐ 4805 ☐ 4810 ☐ 4815 ☐ 4820 ☐ 4825 ☐ 4830 ☐ 4835 ☐ 4840 ☐ 4845 ☐ 4850 ☐ 4855 ☐ 4860 ☐ 4865 ☐ 4870 ☐ 4875 ☐ 4880 ☐ 4885 ☐ 4890 ☐ 4895 ☐ 4900 ☐ 4905 ☐ 4910 ☐ 4915 ☐ 4920 ☐ 4925 ☐ 4930 ☐ 4935 ☐ 4940 ☐ 4945 ☐ 4950 ☐ 4955 ☐ 4960 ☐ 4965 ☐ 4970 ☐ 4975 ☐ 4980 ☐ 4985 ☐ 4990 ☐ 4995 ☐ 5000 ☐ 5005 ☐ 5010 ☐ 5015 ☐ 5020 ☐ 5025 ☐ 5030 ☐ 5035 ☐ 5040 ☐ 5045 ☐ 5050 ☐ 5055 ☐ 5060 ☐ 5065 ☐ 5070 ☐ 5075 ☐ 5080 ☐ 5085 ☐ 5090 ☐ 5095 ☐ 5100 ☐ 5105 ☐ 5110 ☐ 5115 ☐ 5120 ☐ 5125 ☐ 5130 ☐ 5135 ☐ 5140 ☐ 5145 ☐ 5150 ☐ 5155 ☐ 5160 ☐ 5165 ☐ 5170 ☐ 5175 ☐ 5180 ☐ 5185 ☐ 5190 ☐ 5195 ☐ 5200 ☐ 5205 ☐ 5210 ☐ 5215 ☐ 5220 ☐ 5225 ☐ 5230 ☐ 5235 ☐ 5240 ☐ 5245 ☐ 5250 ☐ 5255 ☐ 5260 ☐ 5265 ☐ 5270 ☐ 5275 ☐ 5280 ☐ 5285 ☐ 5290 ☐ 5295 ☐ 5300 ☐ 5305 ☐ 5310 ☐ 5315 ☐ 5320 ☐ 5325 ☐ 5330 ☐ 5335 ☐ 5340 ☐ 5345 ☐ 5350 ☐ 5355 ☐ 5360 ☐ 5365 ☐ 5370 ☐ 5375 ☐ 5380 ☐ 5385 ☐ 5390 ☐ 5395 ☐ 5400 ☐ 5405 ☐ 5410 ☐ 5415 ☐ 5420 ☐ 5425 ☐ 5430 ☐ 5435 ☐ 5440 ☐ 5445 ☐ 5450 ☐ 5455 ☐ 5460 ☐ 5465 ☐ 5470 ☐ 5475 ☐ 5480 ☐ 5485 ☐ 5490 ☐ 5495 ☐ 5500 ☐ 5505 ☐ 5510 ☐ 5515 ☐ 5520 ☐ 5525 ☐ 5530 ☐ 5535 ☐ 5540 ☐ 5545 ☐ 5550 ☐ 5555 ☐ 5560 ☐ 5565 ☐ 5570 ☐ 5575 ☐ 5580 ☐ 5585 ☐ 5590 ☐ 5595 ☐ 5600 ☐ 5605 ☐ 5610 ☐ 5615 ☐ 5620 ☐ 5625 ☐ 5630 ☐ 5635 ☐ 5640 ☐ 5645 ☐ 5650 ☐ 5655 ☐ 5660 ☐ 5665 ☐ 5670 ☐ 5675 ☐ 5680 ☐ 5685 ☐ 5690 ☐ 5695 ☐ 5700 ☐ 5705 ☐ 5710 ☐ 5715 ☐ 5720 ☐ 5725 ☐ 5730 ☐ 5735 ☐ 5740 ☐ 5745 ☐ 5750 ☐ 5755 ☐ 5760 ☐ 5765 ☐ 5770 ☐ 5775 ☐ 5780 ☐ 5785 ☐ 5790 ☐ 5795 ☐ 5800 ☐ 5805 ☐ 5810 ☐ 5815 ☐ 5820 ☐ 5825 ☐ 5830 ☐ 5835 ☐ 5840 ☐ 5845 ☐ 5850 ☐ 5855 ☐ 5860 ☐ 5865 ☐ 5870 ☐ 5875 ☐ 5880 ☐ 5885 ☐ 5890 ☐ 5895 ☐ 5900 ☐ 5905 ☐ 5910 ☐ 5915 ☐ 5920 ☐ 5925 ☐ 5930 ☐ 5935 ☐ 5940 ☐ 5945 ☐ 5950 ☐ 5955 ☐ 5960 ☐ 5965 ☐ 5970 ☐ 5975 ☐ 5980 ☐ 5985 ☐ 5990 ☐ 5995 ☐ 6000 ☐ 6005 ☐ 6010 ☐ 6015 ☐ 6020 ☐ 6025 ☐ 6030 ☐ 6035 ☐ 6040 ☐ 6045 ☐ 6050 ☐ 6055 ☐ 6060 ☐ 6065 ☐ 6070 ☐ 6075 ☐ 6080 ☐ 6085 ☐ 6090 ☐ 6095 ☐ 6100 ☐ 6105 ☐ 6110 ☐ 6115 ☐ 6120 ☐ 6125 ☐ 6130 ☐ 6135 ☐ 6140 ☐ 6145 ☐ 6150 ☐ 6155 ☐ 6160 ☐ 6165 ☐ 6170 ☐ 6175 ☐ 6180 ☐ 6185 ☐ 6190 ☐ 6195 ☐ 6200 ☐ 6205 ☐ 6210 ☐ 6215 ☐ 6220 ☐ 6225 ☐ 6230 ☐ 6235 ☐ 6240 ☐ 6245 ☐ 6250 ☐ 6255 ☐ 6260 ☐ 6265 ☐ 6270 ☐ 6275 ☐ 6280 ☐ 6285 ☐ 6290 ☐ 6295 ☐ 6300 ☐ 6305 ☐ 6310 ☐ 6315 ☐ 6320 ☐ 6325 ☐ 6330 ☐ 6335 ☐ 6340 ☐ 6345 ☐ 6350 ☐ 6355 ☐ 6360 ☐ 6365 ☐ 6370 ☐ 6375 ☐ 6380 ☐ 6385 ☐ 6390 ☐ 6395 ☐ 6400 ☐ 6405 ☐ 6410 ☐ 6415 ☐ 6420 ☐ 6425 ☐ 6430 ☐ 6435 ☐ 6440 ☐ 6445 ☐ 6450 ☐ 6455 ☐ 6460 ☐ 6465 ☐ 6470 ☐ 6475 ☐ 6480 ☐ 6485 ☐ 6490 ☐ 6495 ☐ 6500 ☐ 6505 ☐ 6510 ☐ 6515 ☐ 6520 ☐ 6525 ☐ 6530 ☐ 6535 ☐ 6540 ☐ 6545 ☐ 6550 ☐ 6555 ☐ 6560 ☐ 6565 ☐ 6570 ☐ 6575 ☐ 6580 ☐ 6585 ☐ 6590 ☐ 6595 ☐ 6600 ☐ 6605 ☐ 6610 ☐ 6615 ☐ 6620 ☐ 6625 ☐ 6630 ☐ 6635 ☐ 6640 ☐ 6645 ☐ 6650 ☐ 6655 ☐ 6660 ☐ 6665 ☐ 6670 ☐ 6675 ☐ 6680 ☐ 6685 ☐ 6690 ☐ 6695 ☐ 6700 ☐ 6705 ☐ 6710 ☐ 6715 ☐ 6720 ☐ 6725 ☐ 6730 ☐ 6735 ☐ 6740 ☐ 6745 ☐ 6750 ☐ 6755 ☐ 6760 ☐ 6765 ☐ 6770 ☐ 6775 ☐ 6780 ☐ 6785 ☐ 6790 ☐ 6795 ☐ 6800 ☐ 6805 ☐ 6810 ☐ 6815 ☐ 6820 ☐ 6825 <

Scalar Input Values

Input Parameters For Front End Model 1 (Store Checkout)  
February 24, 1999

Scenario Name: Default

Scenario Description: Default Case For FEM

Parameter	Value	Range	Description
Start time of the simulation scenario (hours)	6	0 to 24 (hours)	Start time of the simulation scenario in hour from midnight. Start time must be less than E time.
End time of the simulation scenario (hours)	23	0 to 24 (hours)	End time of the simulation scenario in hours from midnight. End time must be greater than Start time.
Number of Fast-Track lanes	1	0 to 47	Number of Fast-Track lanes at the front-end. The total number of all lanes (Fast-Track+Express+Regular) cannot exceed 48.
Number of Express lanes	3	0 to 47	Number of Express lanes at the front-end. The total number of all lanes (Fast-Track+Express+Regular) cannot exceed 48.
Number of Regular lanes	13	1 to 48	Number of Regular lanes at the front-end. Must be at least 1 Regular lane. The total number of all lanes (Fast-Track+Express+Regular) cannot exceed 48.

FIG. 14

Run Simulation Module

Models

Model Name	Value
Front End Model 1 (Store Checkout)	1512
Lane Model 1 (Front Facing)	1514
Lane Model 2 (Nelson)	1516
Lane Model 3 (Fast Track)	1518

Scenarios

Scenario Name	Scenario Description
Default	Default Case for FEModel 1
Test 1	Add 4 Checkstands: 1 Express & 3 Regular

Return to Main Menu

Print Scenario

Run Simulation

Animation

FIG. 15

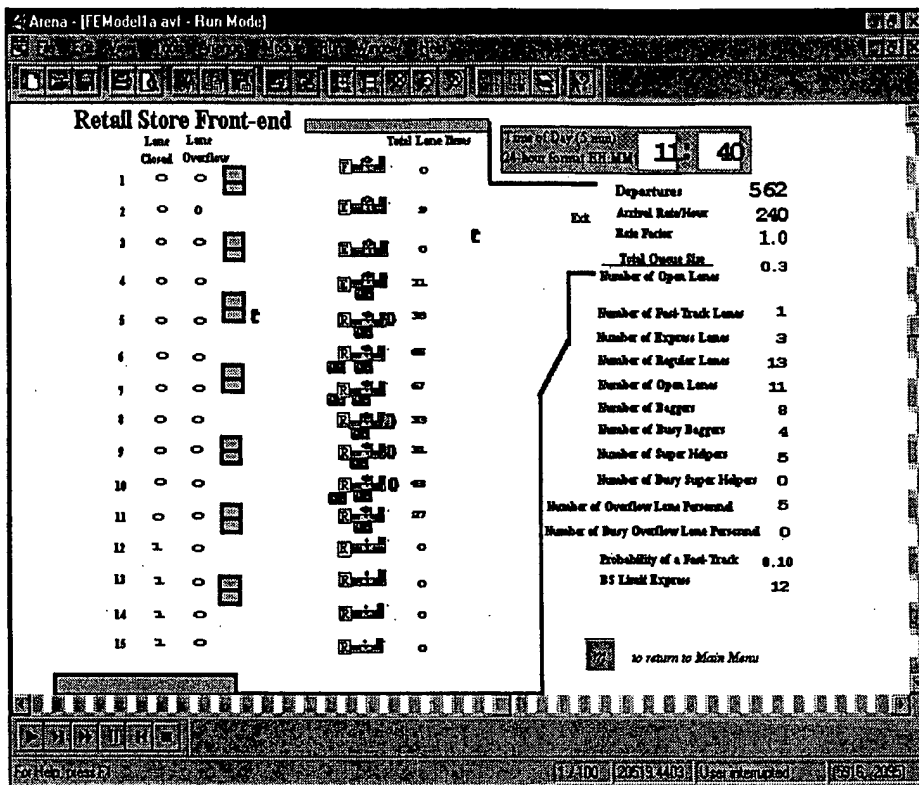


FIG. 16

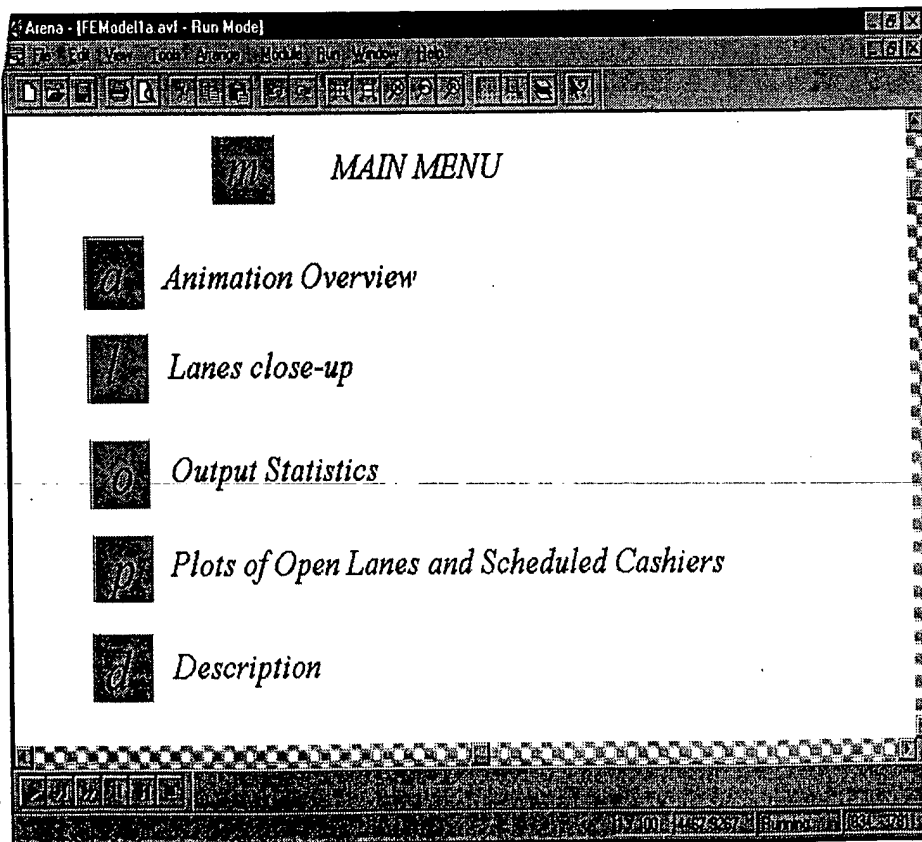


FIG. 17



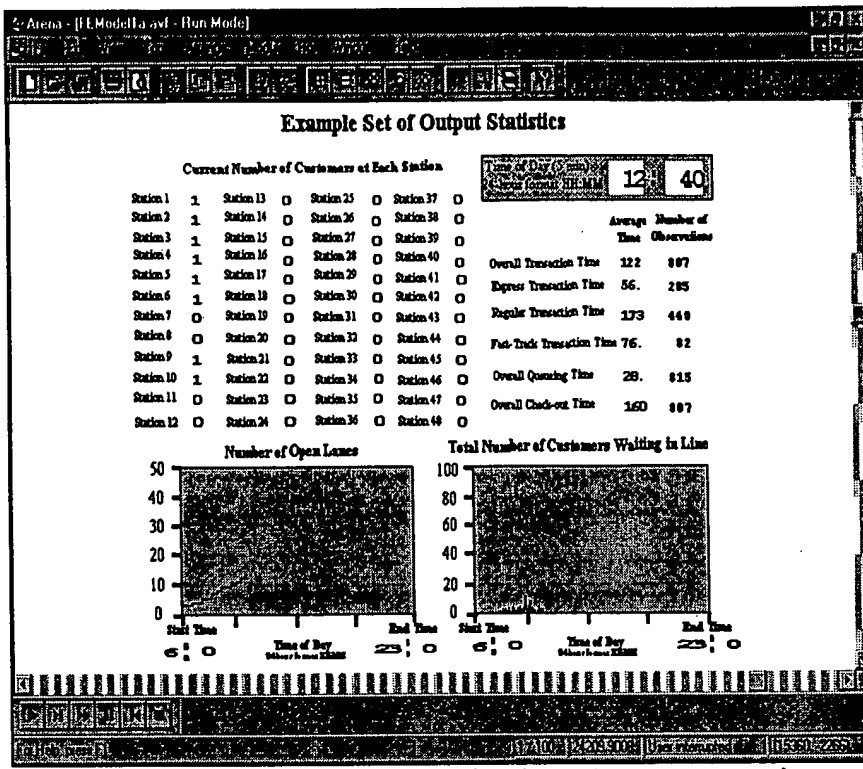


FIG. 18

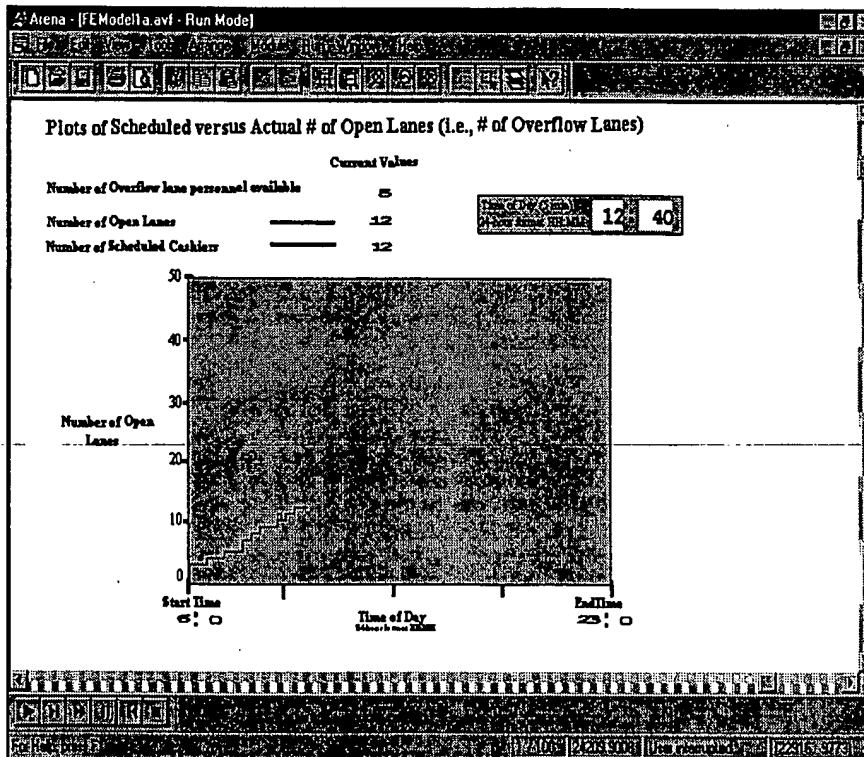


FIG. 19

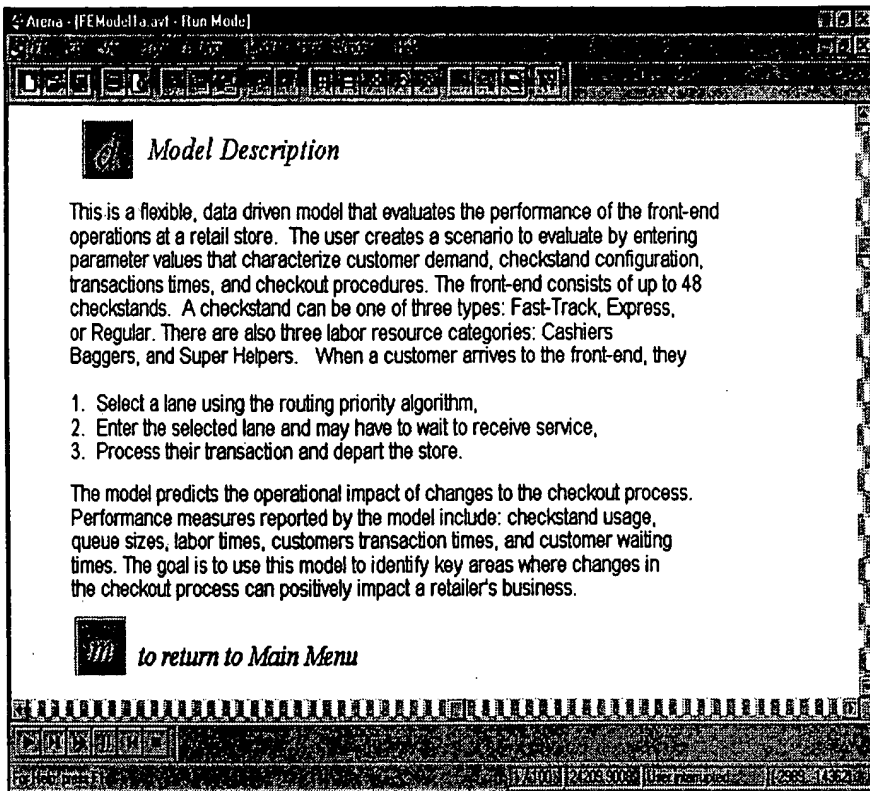


FIG. 20

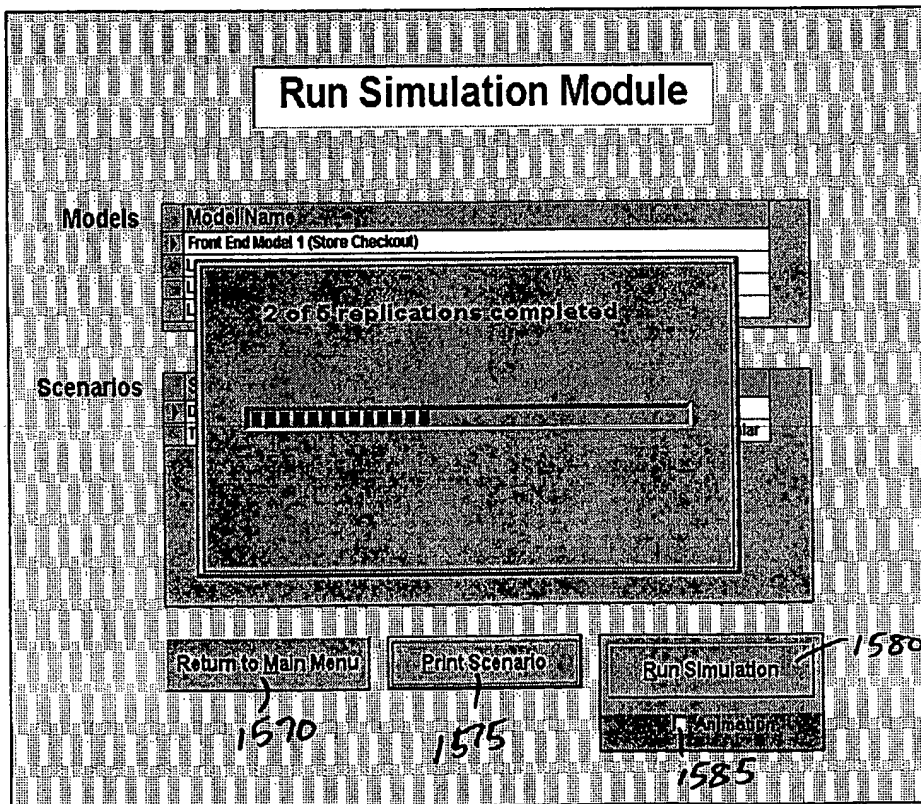


FIG. 21

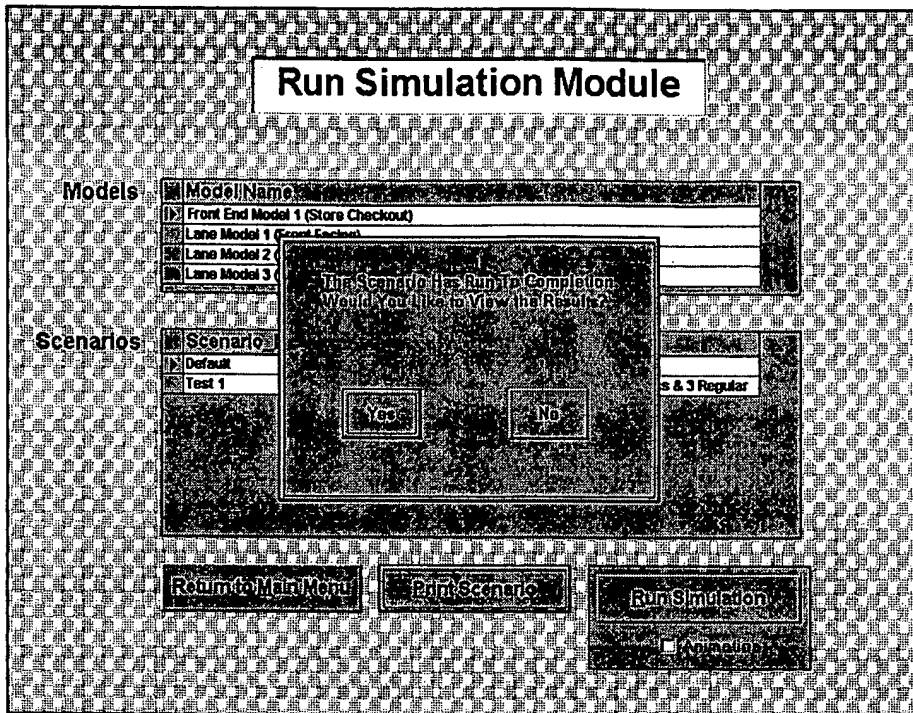


FIG. 22

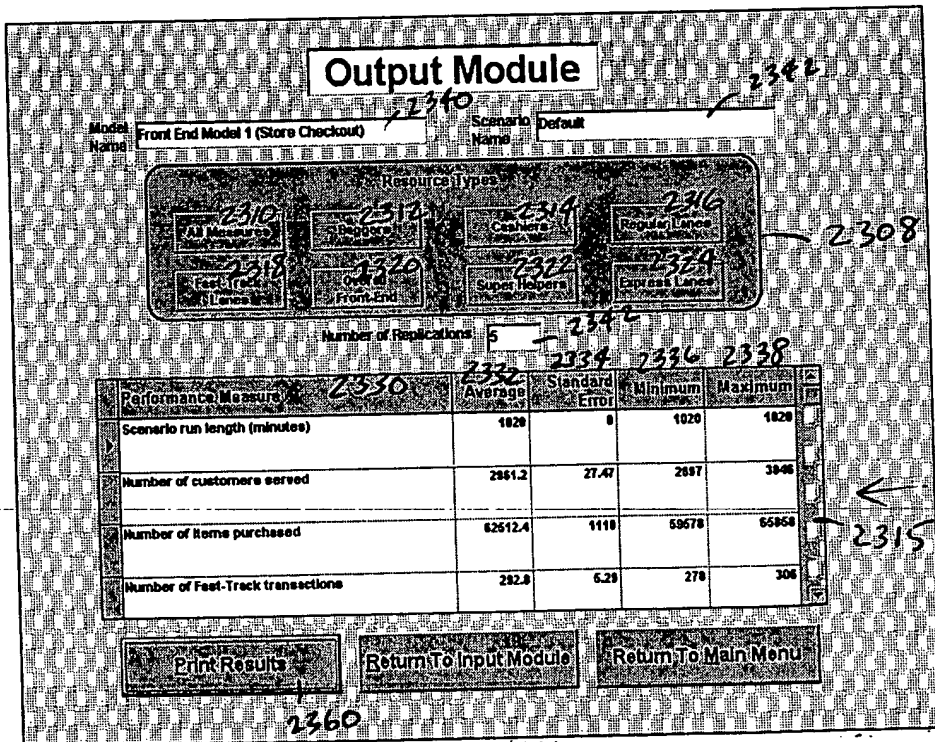


FIG. 23

**Output Module**

Model Name: Lane Model 2 (Nelson) Scenario Name: Default

Resource Types: 2410, 2411, 2414, 2416, 2418, 2408

Number of Replications: 50

Lane #	Performance Measure	Average	Standard Error	Minimum	Maximum
	Scenario run length (minutes)	60	0	60	60
1	Total number of transactions lane 1	15.06	0.45	11	20
2	Total number of transactions lane 2	15.88	0.45	11	24
	Total number of transactions both lanes	37.94	0.88	22	50

Print Results Return to Input Module Return to Main Menu

2400

2440

2442

2444

2430 2436 2438

2406

2418

2460

FIG. 24

Performance Measures

Performance Statistics For Front End Model 1 (Store Checkout)

March 2, 1999

Scenario Name: Default

Scenario Description: Default Case for FEModel 1

Performance Measure	Average	Standard Error	Minimum	Maximum
Scenario run length (minutes)	1,020.00	0.00	1,020.00	1,020.00
Number of customers served	2,956.30	9.94	2,818.00	3,046.00
Number of items purchased	62,134.40	268.63	59,115.00	65,109.00
Number of Fast-Track transactions	287.97	2.75	254.00	315.00
Number of Express transactions	1,036.60	5.78	967.00	1,091.00
Number of Regular transactions	1,631.73	5.56	1,575.00	1,690.00
Number of transactions with basket size less than or equal to Express limit	1,359.13	7.35	1,260.00	1,438.00
Fast-Track basket size	21.13	0.34	18.65	23.50
Express basket size	5.42	0.02	5.15	5.73
Regular basket size	30.91	0.11	29.40	31.76
Number of Fast-Track items checked	746.80	22.65	417.00	1,000.00
Number of Fast-Track 30% audits	28.23	0.98	18.00	40.00

FIG. 25

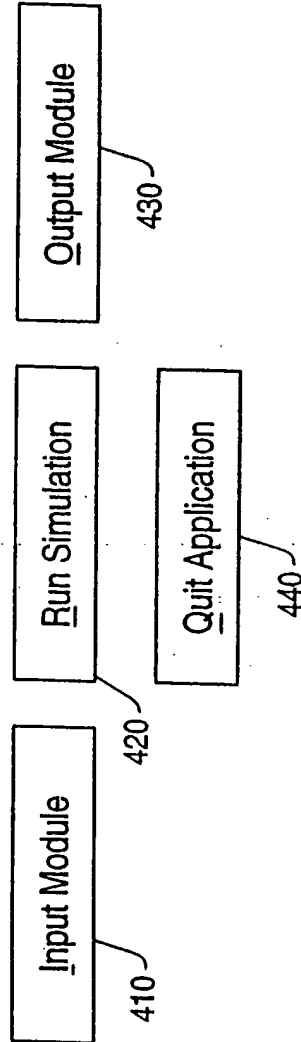
Performance Measures					
Performance Measures For Lane Model 2 (Nelson)					
March 2, 1999					
Scenario Name: Default					
Scenario Description: Default Case for LaneM2					
Performance Measure	Average	Standard Error	Minimum	Maximum	Lane #
Scenario run length (minutes)	60.00	0.00	60.00	60.00	0
Total number of transactions lane 1	19.08	0.45	11.00	26.00	1
Total number of transactions lane 2	18.88	0.45	11.00	24.00	2
Total number of transactions both lanes	37.94	0.88	22.00	50.00	0
Total number of items lane 1	280.10	11.84	112.00	446.00	1
Total number of items lane 2	267.88	10.15	123.00	421.00	2
Total number of items both lanes	647.98	18.92	258.00	868.00	0
Queue size lane 1	0.88	0.14	0.00	6.71	1
Queue size lane 2	0.82	0.11	0.00	3.71	2
Queue size both lanes	1.69	0.24	0.15	9.35	0

FIG. 26



# Lane And Front-End Effectiveness Model

Developed by  
Human Factors Engineering



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FIG. 4

400

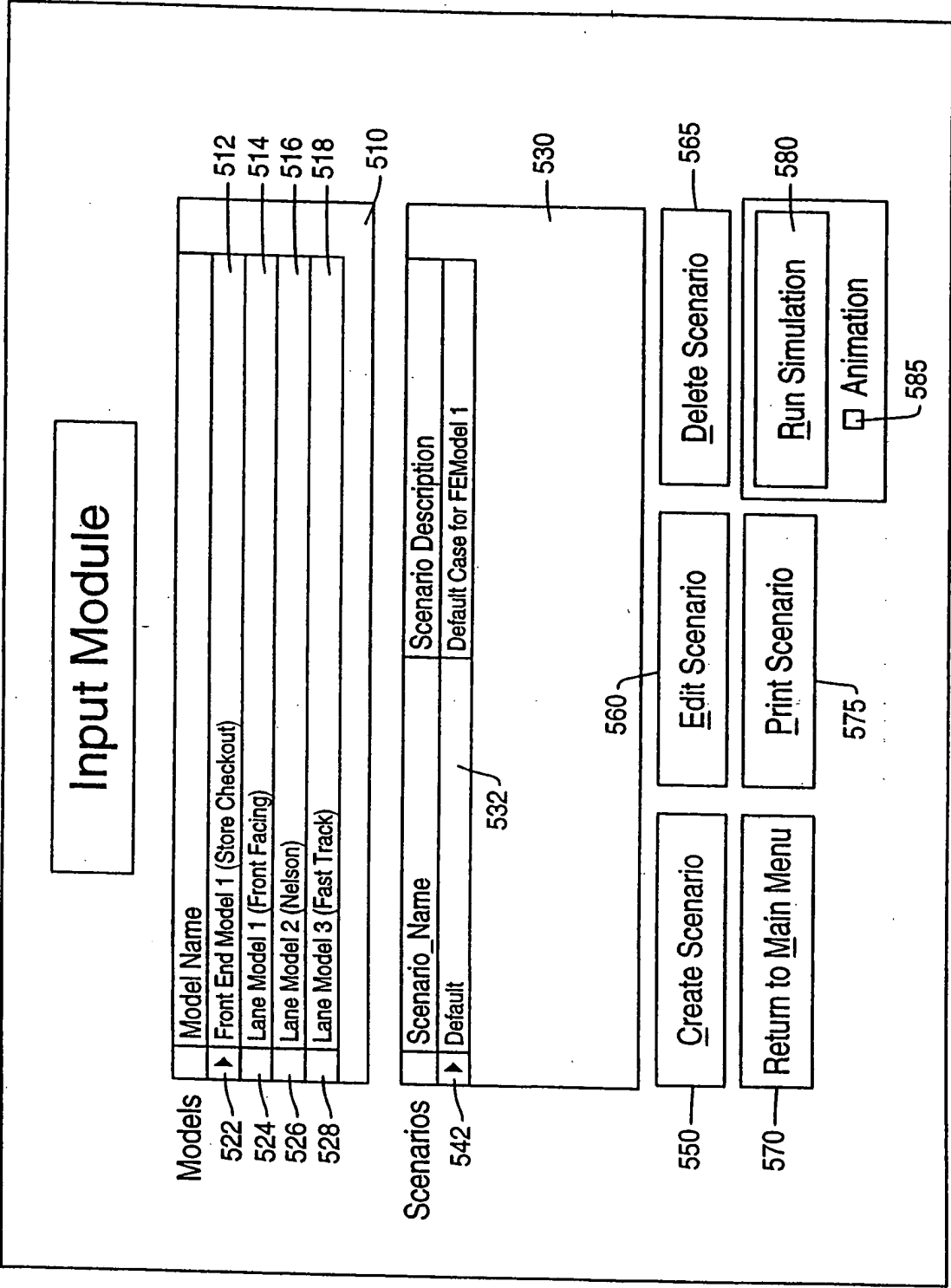


FIG. 5

500

FIG. 6

## Create Parameter File

Model Name

Front End Model 1 (Store Checkout)

640 Please Select the Scenario You Want to Clone

Scenario_Name	Scenario Description
▶ Default	Default Case for FEModel 1

650

Please Type Scenario Name and Description in the Text Boxes Below

Scenario Name

Test 1

620

Scenario Description

Add 4 Checkstands: 1 Express & 3 Regular

630

610

Create and Return

615

Return without Creating

600

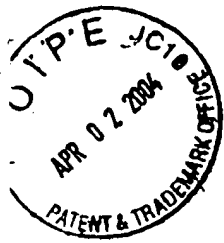




FIG. 7

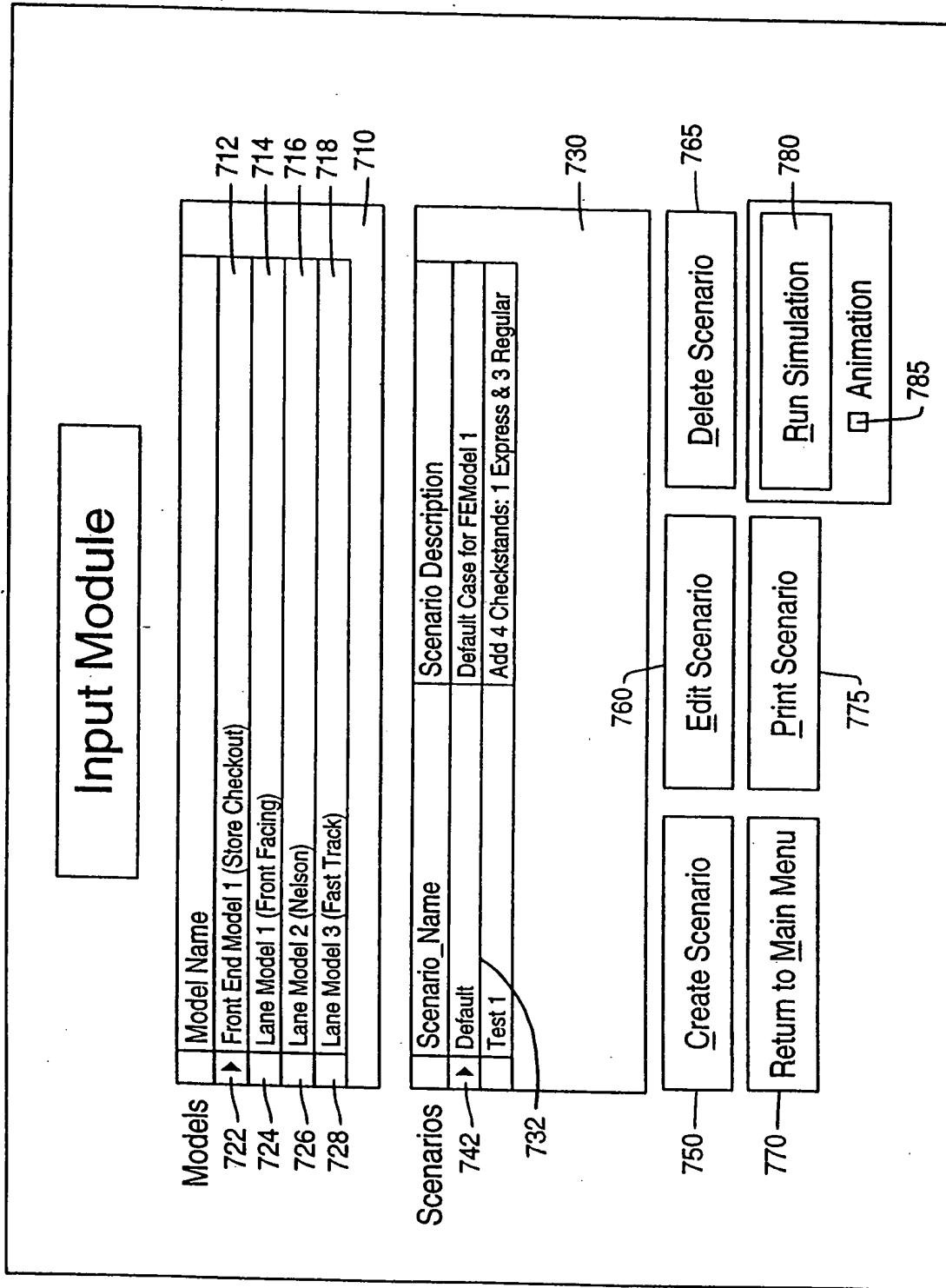


FIG. 8

## Edit Parameter File

Model Name Front End Model 1 (Store Checkout)

Scenario Name Test 1

820

Parameter Categories

822

Transaction Itemization

824

Transaction Finalization

826

Transaction Bagging

828

Transaction Intervention

830

Configuration

832

Customer Demand

834

Schedules

836

Model Parameters

845

Lane Type

F

E

R

All

810

815

Parameter	Value	Range	Description
Start time of the simulation scenario (hours)	6	0 to 24 (hours)	Start time of simulation scenario in hour from midnight
End time of the simulation scenario (hours)	23	0 to 24 (hours)	End time of simulation scenario in hours from midnight. End time must be greater than Start time
Number of Fast-Track lanes	1	0 to 47	Number of Fast-Track lanes at the front-end. The total number of all lanes cannot exceed 48
Number of Express lanes	3	0 to 47	Number of Express lanes at the front-end. The total number of all lanes cannot exceed 48
Number of Regular lanes	13	1 to 48	Number of Regular lanes at the front-end. The total number of

Return to Input Form

## Edit Parameter File

Model Name Lane Model 2 (Nelson)

Scenario Name Default

Parameter Categories

Transaction Pre-Itemization

Configuration

Transaction Itemization

Customer Demand

Transaction Finalization

Model Parameters

Bagging

Intervention

Lane #	Parameter	Value	Range	Description
1	Time length of scenario	60	0.0 to 1440.0 (minutes)	Length of the simulation scenario in minutes
2	Number of baggers	1	0, 1, or 2	Number of baggers; options are 0 baggers, 1 bagger for both lanes, or 2 baggers - one for each lane
All	Maximum number of items on front belt	20	1 to 200	Maximum number of items on front belt
All	Maximum number of items in bagging area	20	1 to 200	Maximum number of items on back belt and bagging area
All	Probability of basket icon	0.5	0.0 to 1.0	Probability a customer uses a basket (vs. cart) when their

Return to Input Form

FIG. 9

900

945

961

962

964

966

950

955

960

965

910

915

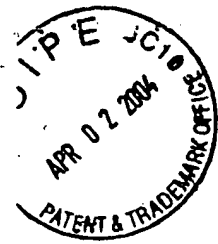


FIG. 10

1000

Arrival Rate Schedule

1040

Time Interval	Number of Arrivals
4:46 AM -- 5:00 AM	0
5:01 AM -- 5:15 AM	0
5:16 AM -- 5:30 AM	0
5:31 AM -- 5:45 AM	0
5:46 AM -- 6:00 AM	0
6:01 AM -- 6:15 AM	4
6:16 AM -- 6:30 AM	12
6:31 AM -- 6:45 AM	8
6:46 AM -- 7:00 AM	20
7:01 AM -- 7:15 AM	28
7:16 AM -- 7:30 AM	20
7:31 AM -- 7:45 AM	24
7:46 AM -- 8:00 AM	28

1050

Enter the number of arrivals per hour in each 15-minute time interval

1015

1010

1060

Print Schedule

1065

Return to Edit Form



FIG. 11

1100

Average Basket Sizes

1140

Time Interval	Avg Basket Size
12:01 AM -- 12:15 AM	0
12:16 AM -- 12:30 AM	0
12:31 AM -- 12:45 AM	0
12:46 AM -- 1:00 AM	0
1:01 AM -- 1:15 AM	0
1:16 AM -- 1:30 AM	0
1:31 AM -- 1:45 AM	0
1:46 AM -- 2:00 AM	0
2:01 AM -- 2:15 AM	0
2:16 AM -- 2:30 AM	0
2:31 AM -- 2:45 AM	0
2:46 AM -- 3:00 AM	0
3:01 AM -- 3:15 AM	0

1115

1110

1160

Print Basket Sizes

1165

Return to Edit Form



# Replacement Sheet 12/33

Schedules

1200

1205

Super Helpers

Regular Cashiers

Express Cashiers

Baggers

All Personnel

Fast-Track Cashiers

1220

1225

1230

1215

1240

1250

1210

1215

Time Interval	Regular Cashiers
12:01 AM -- 12:30 AM	0
12:31 AM -- 1:00 AM	0
1:01 AM -- 1:30 AM	0
1:31 AM -- 2:00 AM	0
2:01 AM -- 2:30 AM	0
2:31 AM -- 3:00 AM	0
3:01 AM -- 3:30 AM	0
3:31 AM -- 4:00 AM	0
4:01 AM -- 4:30 AM	0
4:31 AM -- 5:00 AM	0
5:01 AM -- 5:30 AM	0
5:31 AM -- 6:00 AM	0
6:01 AM -- 6:30 AM	2
6:31 AM -- 7:00 AM	2
7:01 AM -- 7:30 AM	3
7:31 AM -- 8:00 AM	3
8:01 AM -- 8:30 AM	3

Print Schedules

Return to Edit Form

1260

1265

FIG. 12

1200

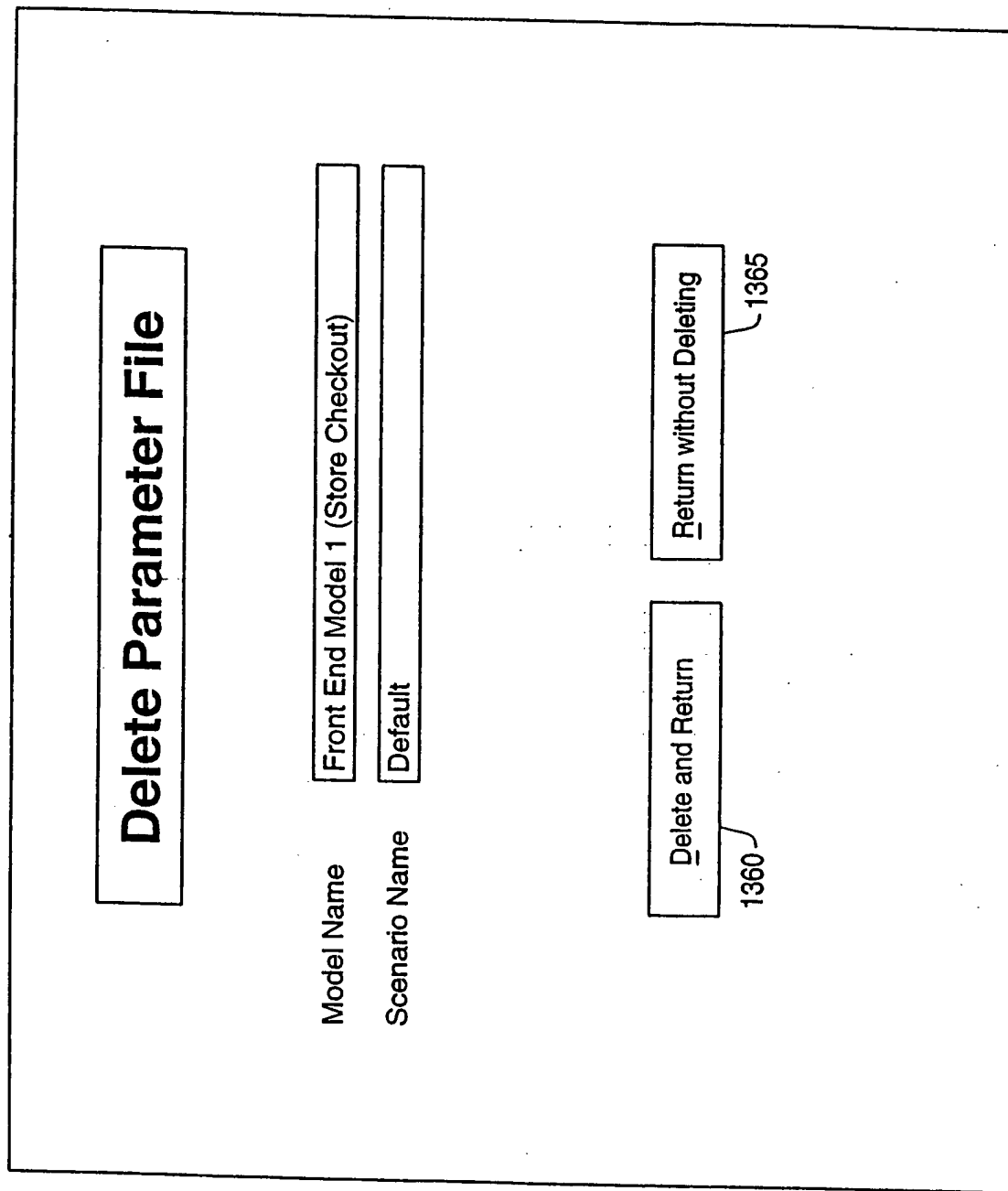
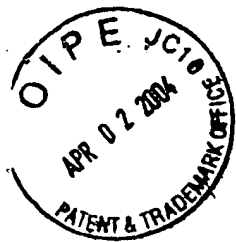


FIG. 13

1300



Replacement Sheet

14/33

Scalar Input Values

1 of 1+ 88% Total: 141 100% 141 of 141

### Input Parameters For Front End Model 1 (Store Checkout)

February 24, 1999

Scenario Name: Default

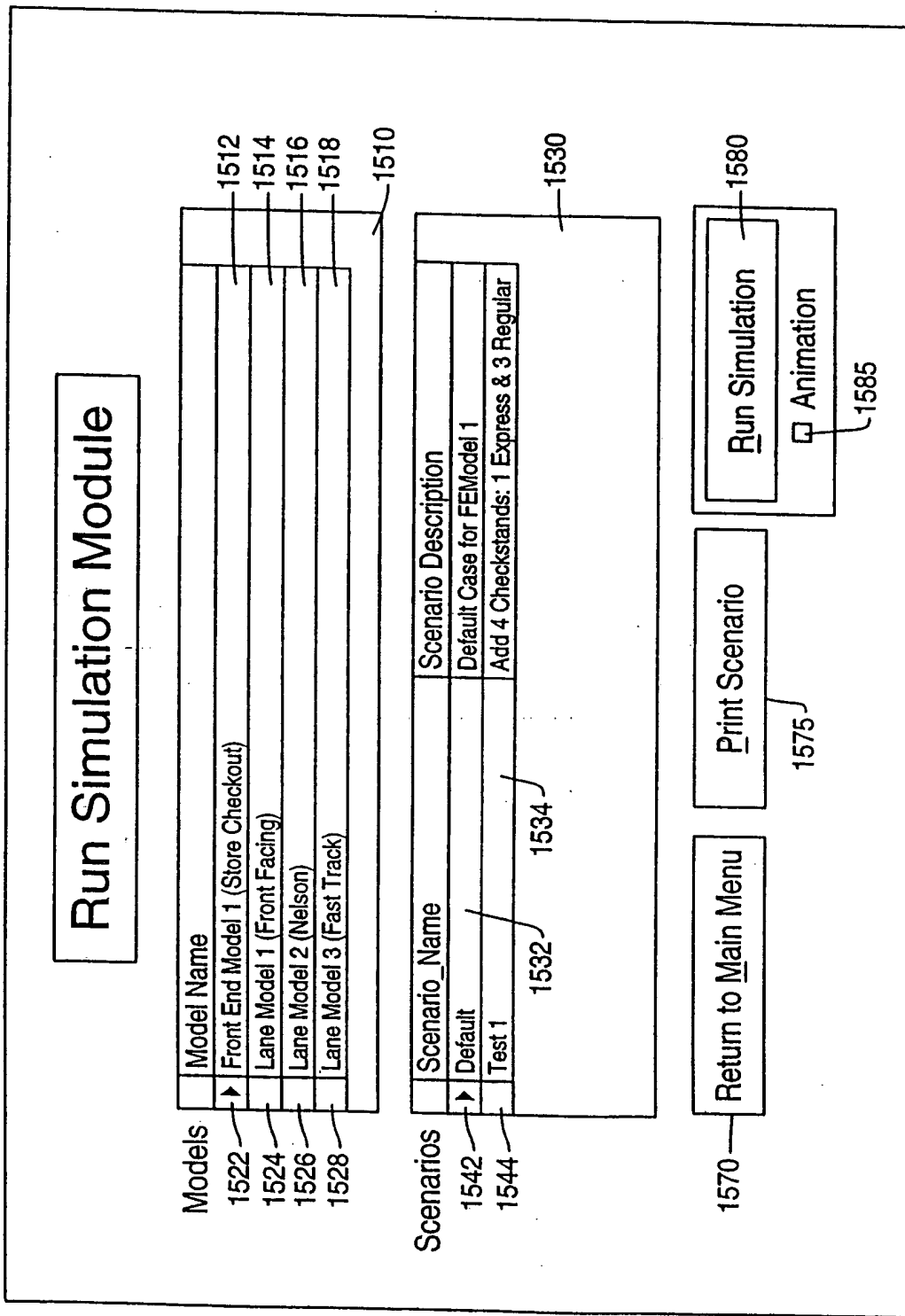
Scenario Description: Default Case For FEM

Parameter	Value	Range	Description
Start time of the simulation scenario (hours)	6	0 to 24 (hours)	Start time of the simulation scenario in hour from midnight. Start time must be less than End time.
End time of the simulation scenario (hours)	23	0 to 24 (hours)	End time of the simulation scenario in hours from midnight. End time must be greater than Start time.
Number of Fast-Track lanes	1	0 to 47	Number of Fast-Track lanes at the front-end. The total number of all lanes (Fast-Track + Express + Regular) cannot exceed 48.
Number of Express lanes	3	0 to 47	Number of Express lanes at the front-end. The total number of all lanes (Fast-Track + Express + Regular) cannot exceed 48.
Number of Regular lanes	13	1 to 48	Number of Regular lanes at the front-end. Must be at least 1 Regular lane. The total number of all lanes (Fast-Track + Express + Regular) cannot exceed 48.

FIG. 14



FIG. 15





Replacement Sheet 16/33

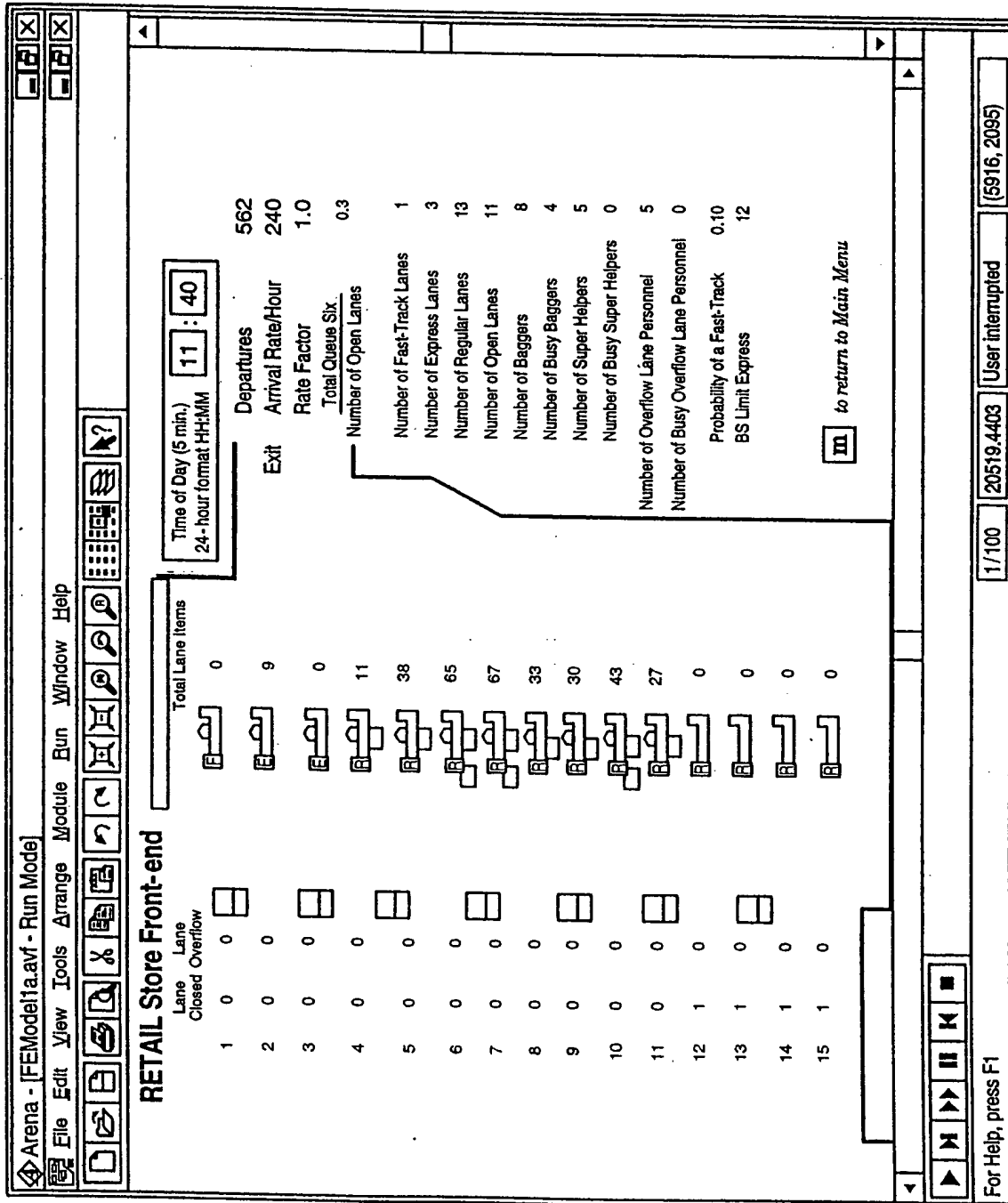


FIG. 16

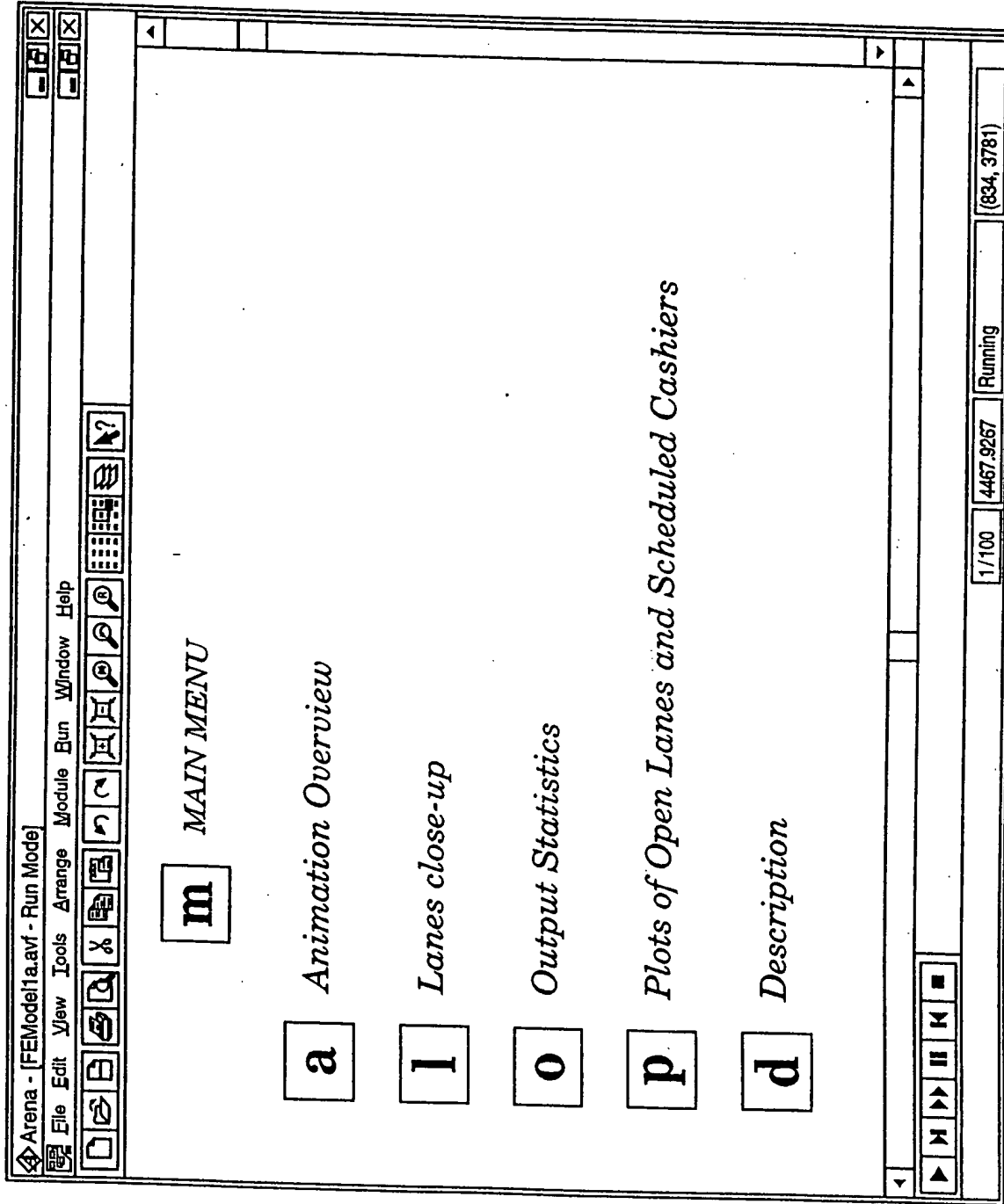
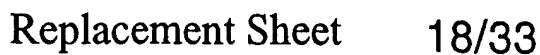


FIG. 17



**Arena Viewer - [FEModel1a.avf - Run Mode]**

File Edit View Tools Arrange Module Run Window Help

### Example Set of Output Statistics

Time of Day (5 min.)  
24-hour format HH:MM

**12 : 40**

	Average Time	Number of Observations
Overall Transaction Time	122	987
Express Transaction Time	56	285
Regular Transaction Time	173	440
Fast-Track Transaction Time	76	82
Overall Queuing Time	28.	815
Overall Check-out Time	160	887

Current Number of Customers at Each Station

Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48		
Customers	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Number of Open Lanes

Start Time 6:0      End Time 23:0  
Time of Day

Total Number of Customers Waiting in Line

Start Time 6:0      End Time 23:0  
Time of Day

For Help, press F1

1/100    24209.9008    User interrupted    (15360, 2266)

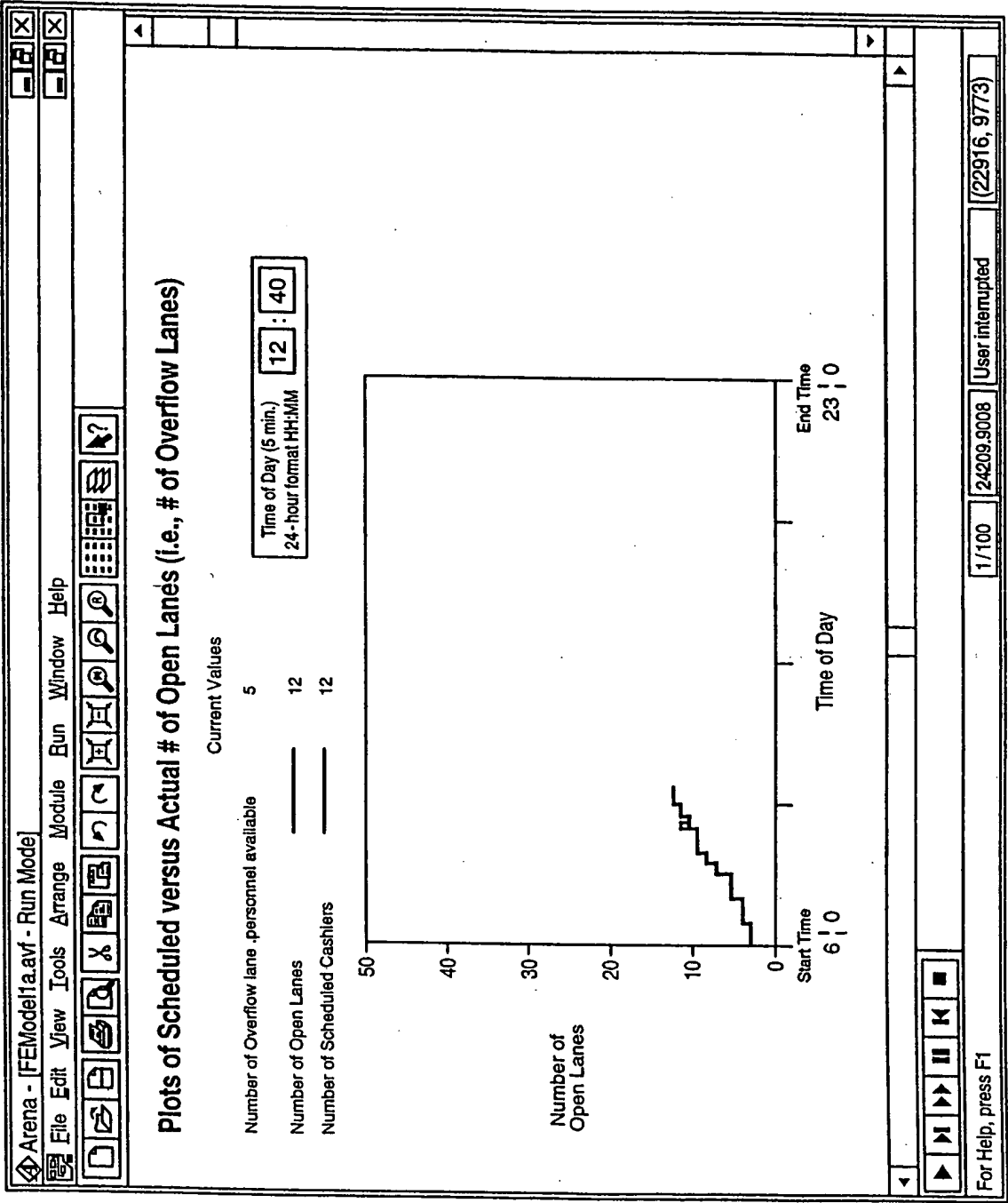


FIG. 19

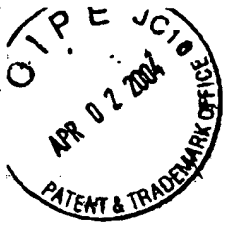


FIG. 20

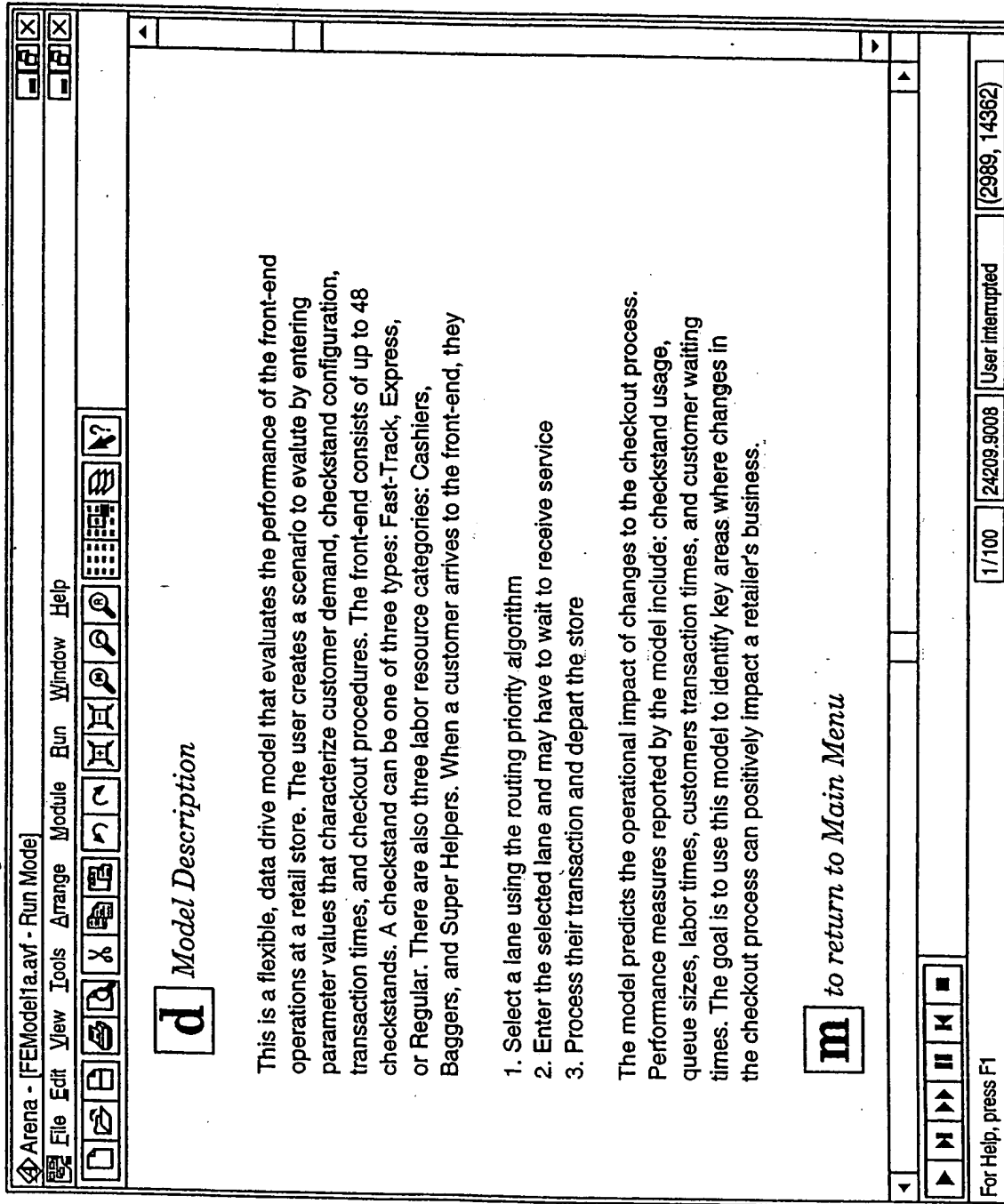
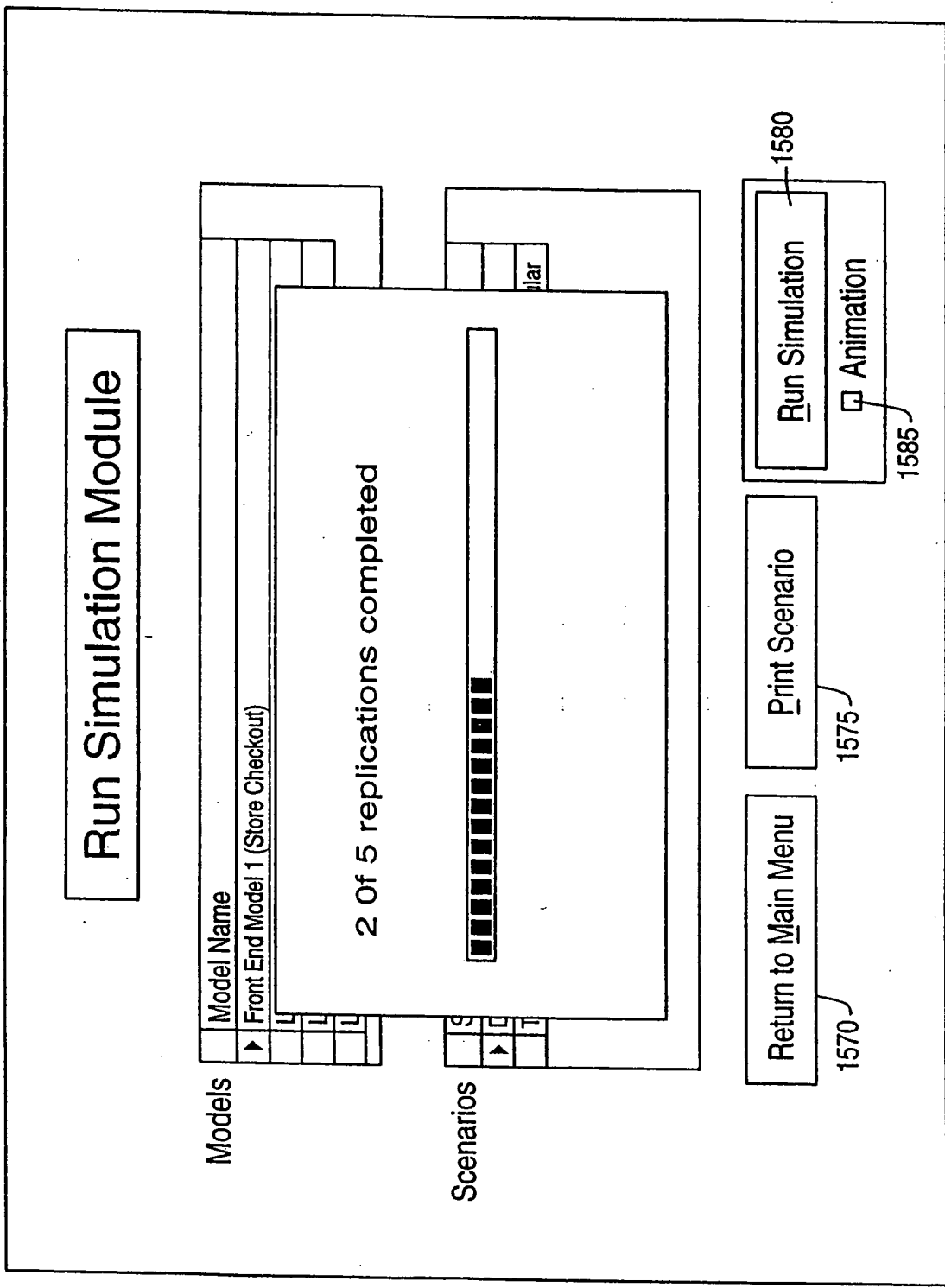


FIG. 21



Run Simulation Module

**Models**

Model Name
▶ Front End Model 1 (Store Checkout)
Lane Model 1
Lane Model 2
Lane Model 3

**Scenarios**

Scenario_Name
▶ Default
Test 1
s & 3 Regular

The Scenario Has Run To Completion.  
Would You Like To View The Results?

Yes

No

Return to Main Menu

Print Scenario

Run Simulation

☐ Animation

FIG. 22



## Output Module

Model Name Front End Model 1 (Store Checklist) 2340

Scenario Name Default 2342

Resource Types

2310 All Measures 2312

2318 Fast-Track Lanes

2314 Baggers

2322 Overall Front End

2316 Cashiers

2324 Super Helpers

2316 Regular Lanes

2324 Express Lanes

2308

Number of Replications 5 2342

2320 2330 2332 2334 2336 2338

Performance Measure	Average	Standard Error	Minimum	Maximum
Scenario run length (minutes)	1020	0	1020	1020
Number of customers served	2961.2	27.47	2897	3846
Number of items purchased	62512.4	1110	59578	65858
Number of Fast-Track Transactions	292.8	5.29	278	306

Print Results 2360

Return to Input Module

Return to Main Menu

FIG. 23

2300

## Output Module

Model Name Lane Model 2 (Nelson) Scenario Name Default

2442

2410  
All Measures

2412  
Customer

2414  
Cashier

2416  
Lane

2418  
Bagger

2408

Number of Replications 50

Lane #

1

2

All

Performance Measure	Average	Standard Error	Minimum	Maximum
Scenario run length (minutes)	60	0	60	60
Total number of transactions lane 1	19.06	0.45	11	26
Total number of transactions lane 2	18.88	0.45	11	24
Total number of transactions both lanes	37.94	0.88	22	58

2430

2432

2434

2436

2444

2438

Print Results

Return to Input Module

Return to Main Menu

2460

FIG. 24

2400

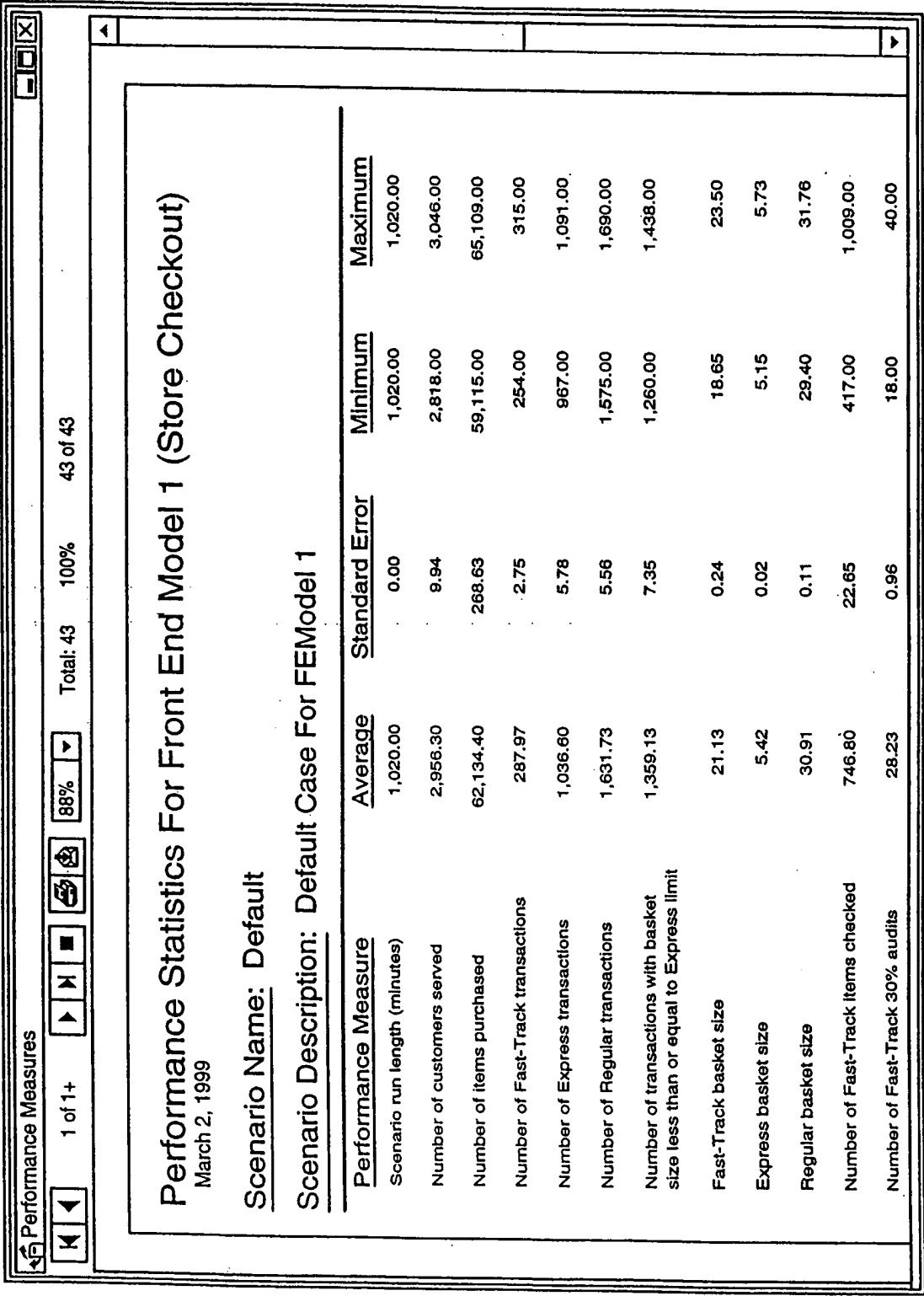
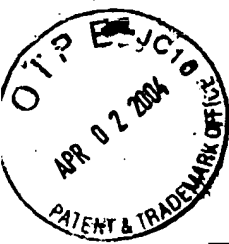


FIG. 25

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